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Engineering News-Record

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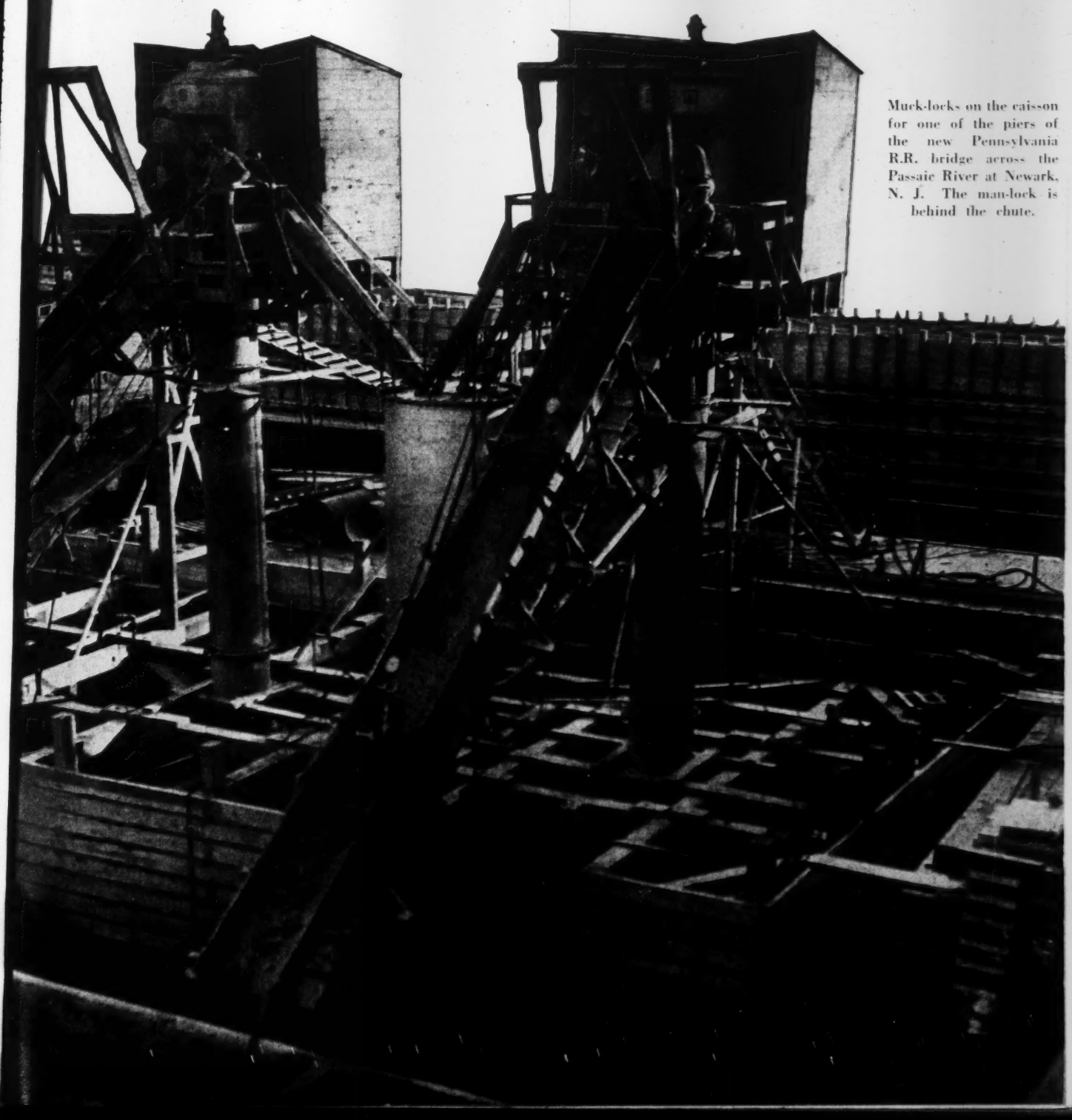
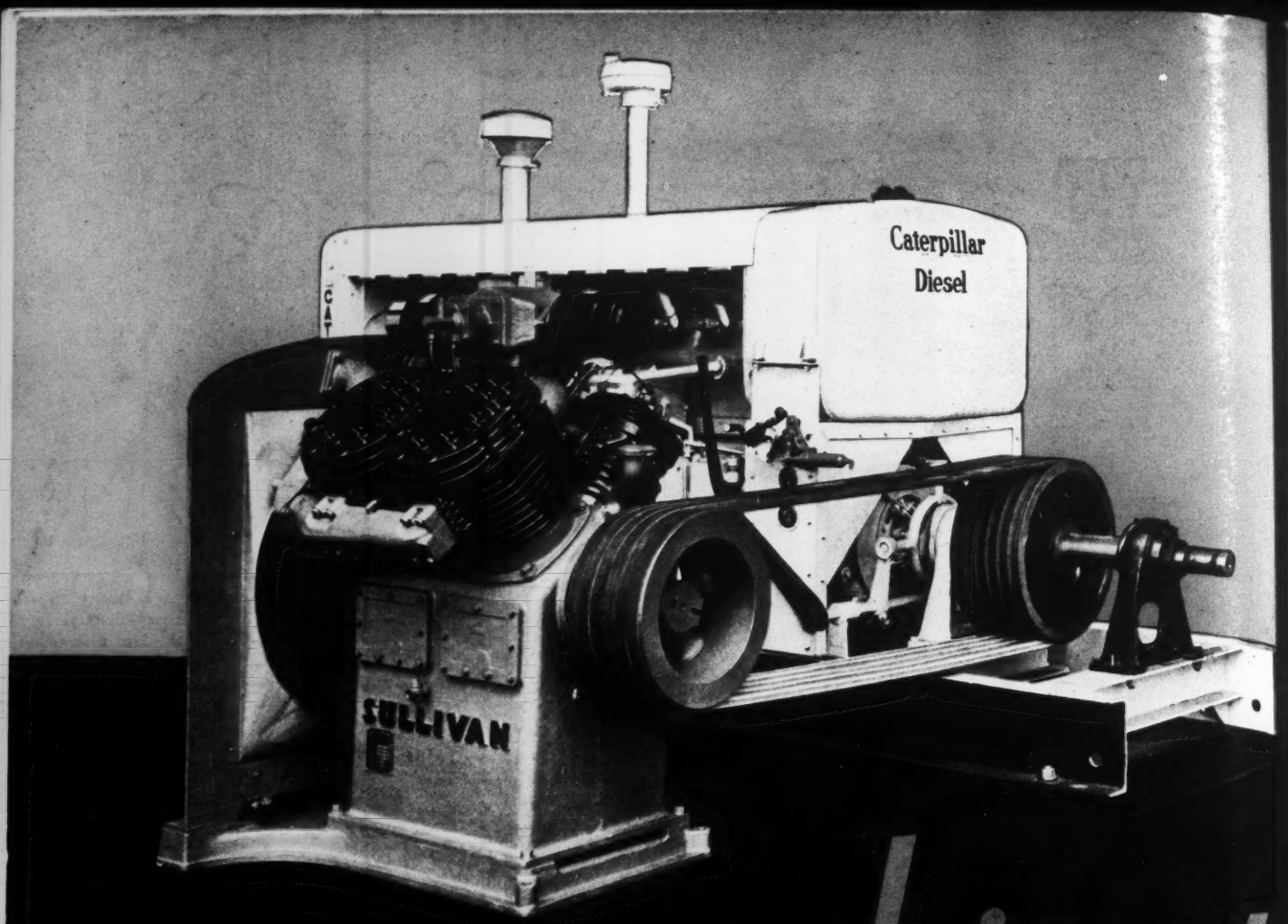


Muck-locks on the caisson for one of the piers of the new Pennsylvania R.R. bridge across the Passaic River at Newark, N. J. The man-lock is behind the chute.



SULLIVAN" SOLD ON THE POWER THAT'S *first*

Advanced design, easy operation, and substantial cost savings feature this air-compressor made by the Sullivan Machinery Co., Chicago. The same features in the "Caterpillar" Diesel Engine led Sullivan to team it with their compressor. The "Caterpillar" Diesel combination of greatly reduced operating costs and reliable performance has led to its adoption by most manufacturers of powered equipment. It's the SHOW-DOWN on portable and stationary power. When you buy equipment, be sure it's "Caterpillar" Diesel-powered. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR DIESEL

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SELF-INTEREST—True and False

WITH the opening of another national campaign we face again the exacting task of self-government. The literature of liberty abounds with acclaim for its privileges and benefits; it dwells but lightly on its obligations and burdens. But every benefit has its price; man cannot live by yearning alone. Somehow, somewhere, some day he must pay for all he gets, even for his liberty.

All this becomes more pertinent as our productive activities breed an ever narrower specialization of function. Once every man carried on by himself substantially all the activities necessary to his well-being. His needs were few and simple; he could discern his interests clearly; he could trace directly the relation between what he did and what he had.

But with the prodigious integration of effort incident to modern productive industry, each must specialize and concentrate with but a sketchy understanding of the complete process by which he lives. None can live for himself alone; the welfare of each is bound up with the welfare of all.

Thus none can find his true welfare by seeking only his immediate interest. Although our acts may not strike back at us so immediately or directly, action and reaction still are equal and opposite in direction; our understanding of what goes on is but obscured by the devious channels through which modern economic forces must operate.

Because of all this we are easily deceived by ourselves and by others. We are prone to self-justification and are easily convinced that our ills are not of our own making. Each seeks and follows leadership that will pander to his interests of today, confident that if he can but gratify them he will be able to beat the game.

BUT if political liberty ever is eclipsed it will be because men will have permitted such selfishness to obscure their self-interest. This is not to deny the theory of democratic government that the general welfare must be sought as the resultant of conflicting individual interests. It is but to assert that the resultant cannot represent the general welfare unless the components truly represent actual individual interests.

When, through lack of vision, information or understanding, the individual cannot discern his own best interest or when he becomes the witless prey of false propaganda or irrational emotion, he is unlikely to act in his own best interest: the resultant of all such efforts, therefore, cannot be in the general interest. It is just such ferments of misdirected energy that breed the tyranny of the mob or of the dictator.

So, as we approach once again the exercise of our democratic franchise, let us try not to be blinded either by class or partisan loyalty or by a divine discontent with what surely needs reform into betraying our true self-interest. Let us all, of every class, see some truths clearly: that we cannot get something for nothing and keep on getting it; that we cannot divide among us what we do not produce; that we cannot destroy the incentives to human effort and maintain our productivity; that no one can gain by promoting his individual interests if those are detrimental to the general welfare; that we cannot, by the manipulation of money or credit for acquisitive purposes, increase our store of the goods and services by which alone we can enjoy higher standards of living.

THESE and kindred issues confront us in these times. Each of us is prone to judge them as they *seem* to affect his own interest *at the moment*. We shall be wiser, even in our own interests, if we remember that what seems to be to our immediate interest may cost us dearly in the long run and that what may be hard to take at the moment may be to our highest interest.

It has been said that when there is no vision the people perish. It is equally true that when there is no understanding of true self-interest democracy must fail.

Willard Chevalier

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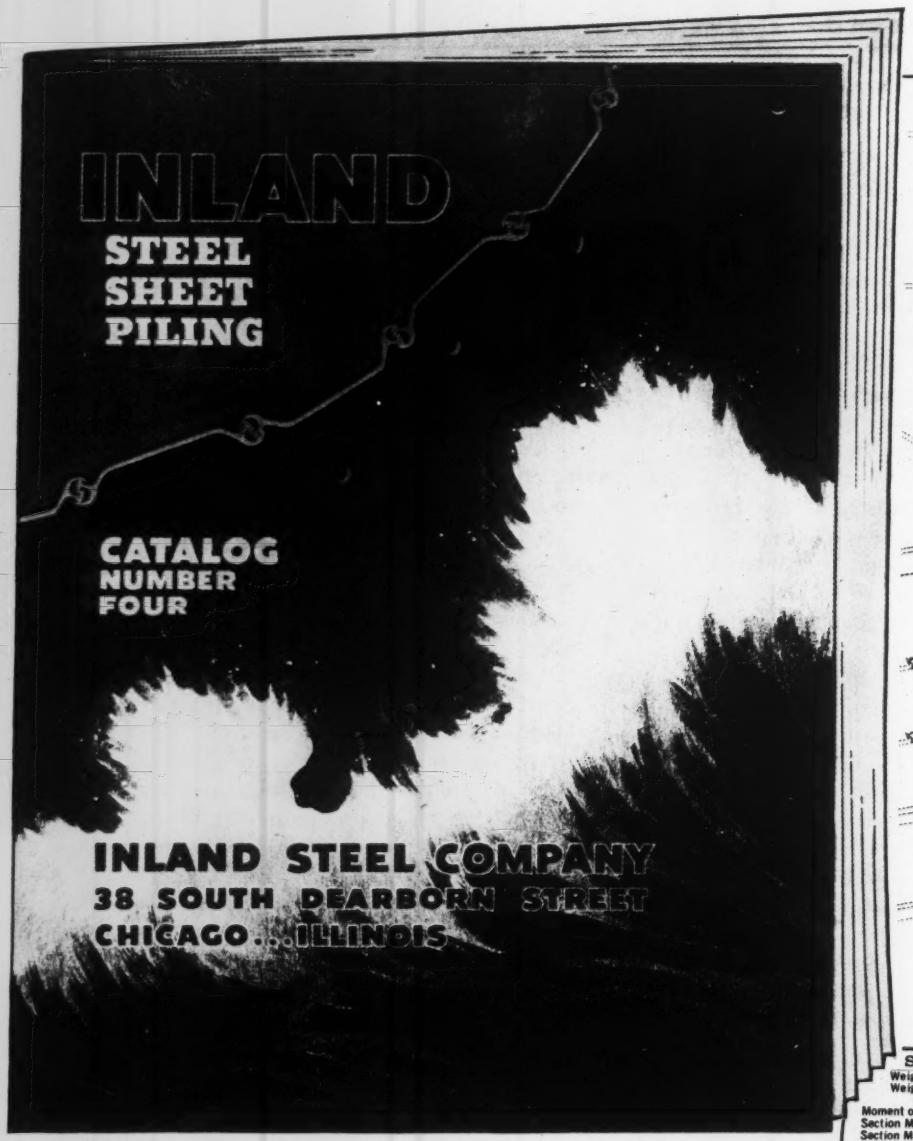

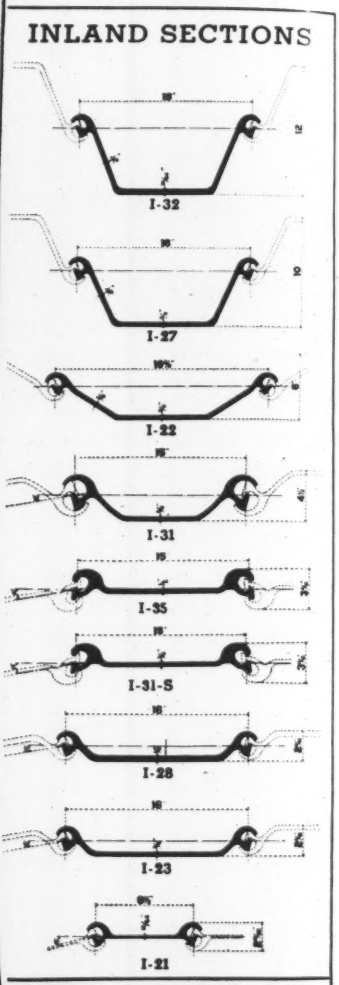

SECTION	I-32	I-27	I-22
Weight per foot	42.7 lbs.	36.0 lbs.	36.0 lbs.
Weight per sq. ft. of wall	32.0 lbs.	27.0 lbs.	22.0 lbs.
Moment of inertia	87.0 in.^{4}	53.0 in.^{4}	22.4 in.^{4}
Section Modulus	20.4 in.^{3}	14.3 in.^{3}	8.8 in.^{3}
Section Modulus per lineal foot of wall	15.3 in.^{3}	10.7 in.^{3}	5.4 in.^{3}
Section Modulus per foot Interlocked	24.5 in.^{3}		
Strength of interlock per lineal in. in direct tension	8,000 lbs.	8,000 lbs.	8,000 lbs.

SECTION	I-31	I-35	I-31-S
Weight per foot	38.8 lbs.	43.8 lbs.	38.8 lbs.
Weight per sq. ft. of wall	31.0 lbs.	35.0 lbs.	31.0 lbs.
Moment of inertia	17.9 in.^{4}	6.1 in.^{4}	6.0 in.^{4}
Section Modulus	8.1 in.^{3}	3.8 in.^{3}	3.7 in.^{3}
Section Modulus per lineal foot of wall	6.5 in.^{3}	3.1 in.^{3}	3.0 in.^{3}
Strength of interlock per lineal in. in direct tension	10,000 lbs.	12,000 lbs.	12,000 lbs.

SECTION	I-28	I-23	I-21
Weight per foot	37.3 lbs.	30.7 lbs.	14.9 lbs.
Weight per sq. ft. of wall	28.0 lbs.	23.0 lbs.	21.0 lbs.
Moment of inertia	6.0 in.^{4}	5.5 in.^{4}	1.0 in.^{4}
Section Modulus	3.3 in.^{3}	3.2 in.^{3}	1.0 in.^{3}
Section Modulus per lineal foot of wall	2.5 in.^{3}	2.4 in.^{3}	1.4 in.^{3}
Strength of interlock per lineal in. in direct tension	12,000 lbs.	12,000 lbs.	8,000 lbs.

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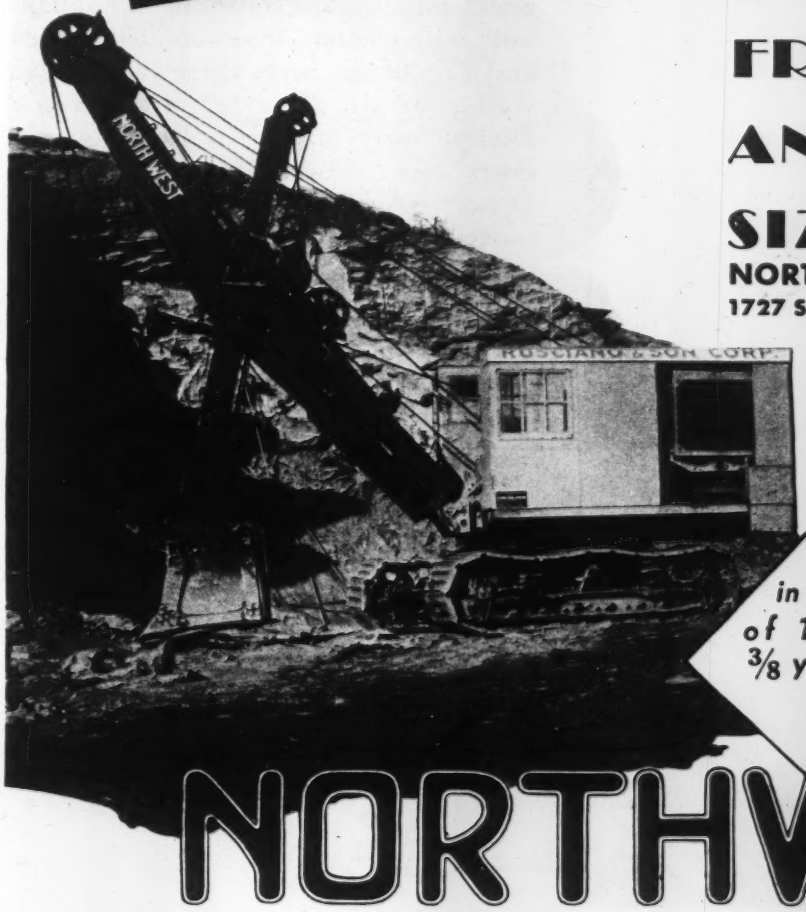

THE HUSKIEST FRONT END ON ANY SHOVEL— SIZE FOR SIZE

NORTHWEST ENGINEERING CO.
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GASOLINE • ELECTRIC • DIESEL • OIL

Built in a range of 15 SIZES 3/8 yd. capacity and Larger

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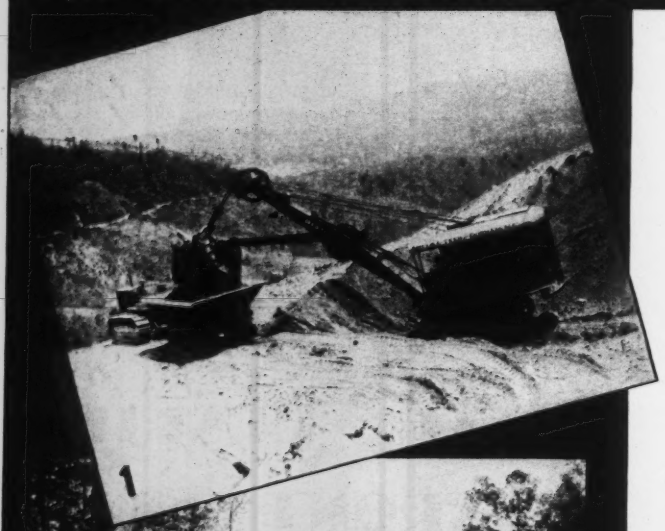
Photo: Underwood & Underwood

Again LORAINS DOMINATE



12 NEW LORAINS out of the 18 shovels busy at present moving 4,000,000 yards in grading 85 additional miles of Skyline Highway* —That is the measure of Lorain supremacy on the Nation's biggest highway project—Where shovels must really "high-ball" to move the huge yardages in the workable summer months—Where shovels must handle every type of materials, with plenty of huge cuts and tough, hard rock—Where shovels must stand up and "take-it" under constant double-shifting, in remote, inaccessible mountain locations—That Lorains, built with Center Drive simplicity, efficiency and ruggedness meet these requirements is well proved by the fact that ever since Skyline work started in 1934, two out of every three shovels used on it have been Lorains—Again demonstrating that Lorains move more material, faster at lesser costs.

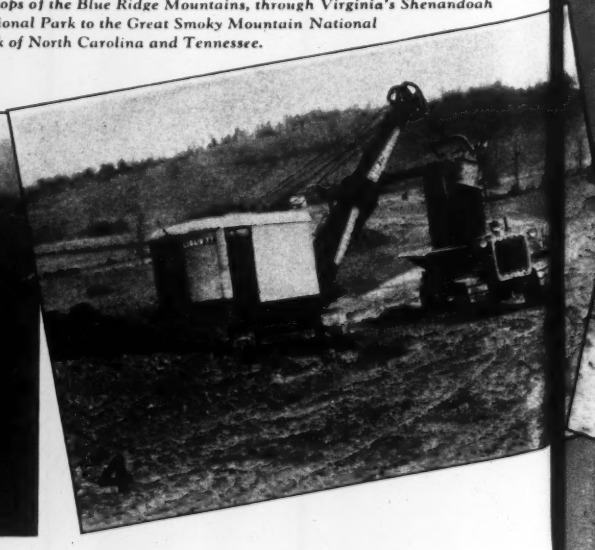
THE THEW SHOVEL COMPANY, LORAIN, OHIO

* *This beautiful scenic highway, when finished, will extend 400 miles along the tops of the Blue Ridge Mountains, through Virginia's Shenandoah National Park to the Great Smoky Mountain National Park of North Carolina and Tennessee.*

LORAINS

THEW CENTER DRIVE

3/8 to 2 yd.



THE SKYLINE HIGHWAY

1 Wade L. Teer, Durham, N. C., 7 Miles, 400,000 yds., 1½ yd. L-77. (4 Loreins)

2 W. W. Tuck & Sons, Virginia, Va., 10 Miles, 250,000 yds., 1½ yd. L-77. (3 Loreins)

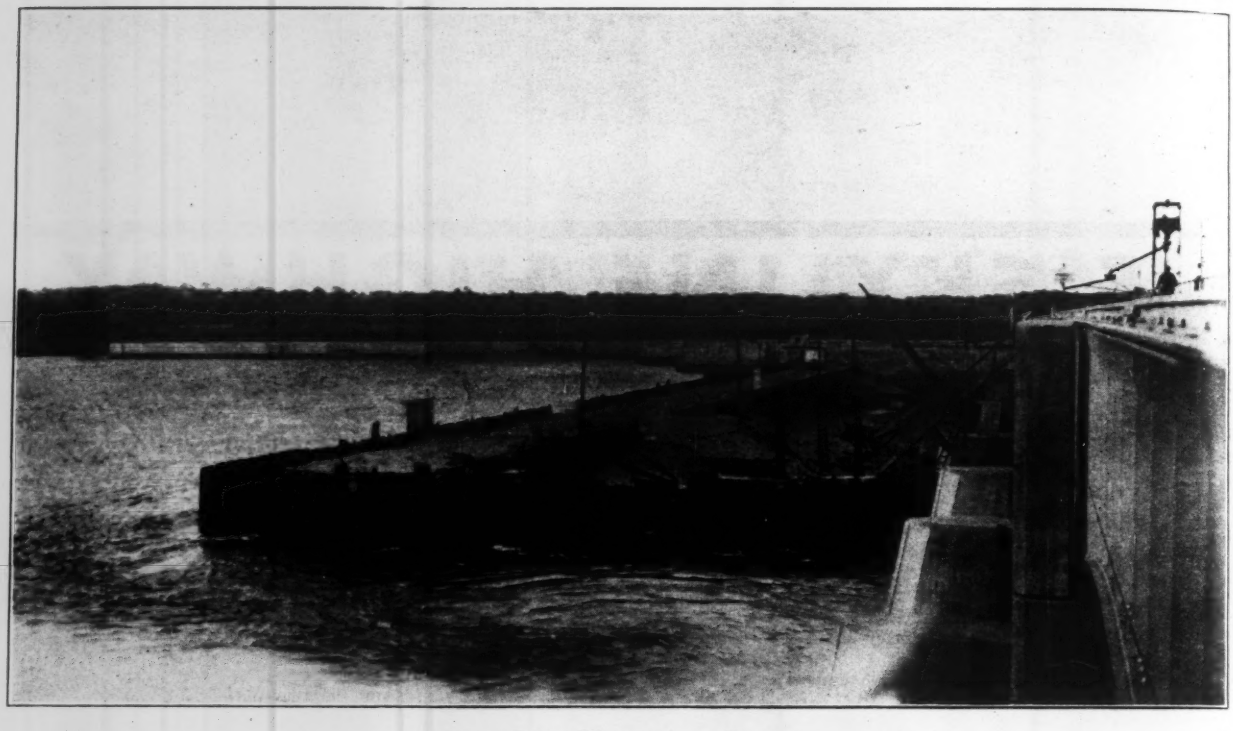
3 T. M. Strider & Company, Nashville, Tenn., 11 Miles, 280,000 yds., 1½ yd. L-77. (7 Loreins)

4 J. W. Grocock, Fayetteville, N. C., 8 Miles, 300,000 yds., 1½ yd. L-77. (3 Loreins)

5 Ralph E. Mills, Frankfort, Ky., 6 Miles, 250,000 yds., 2 yd. L-87. (3 Loreins)

6 C. A. Rowland, Lockburg, N. C., 9 Miles, (No.) 400,000 yds., 2 yd. L-87; (S.C.) 300,000 yds., 1½ yd. L-756. (3 Loreins)

7 M. E. Gilliss, Macon, Miss., 17 Miles, 1,000,000 yds., 2 yd. (L-87) two 1½ yd. L-77's. (10 Loreins)



Dam 16—Muscatine, Iowa

HIGHEST WATER *in Fifteen Years*

Inside the big cofferdams—the Moretrench Wellpoint System took the seepage out *just a little faster than it came in.* Concreting went on under comfortable, dry conditions.

"MAKES EVERY JOB A DRY JOB"

Your order to us insures that.

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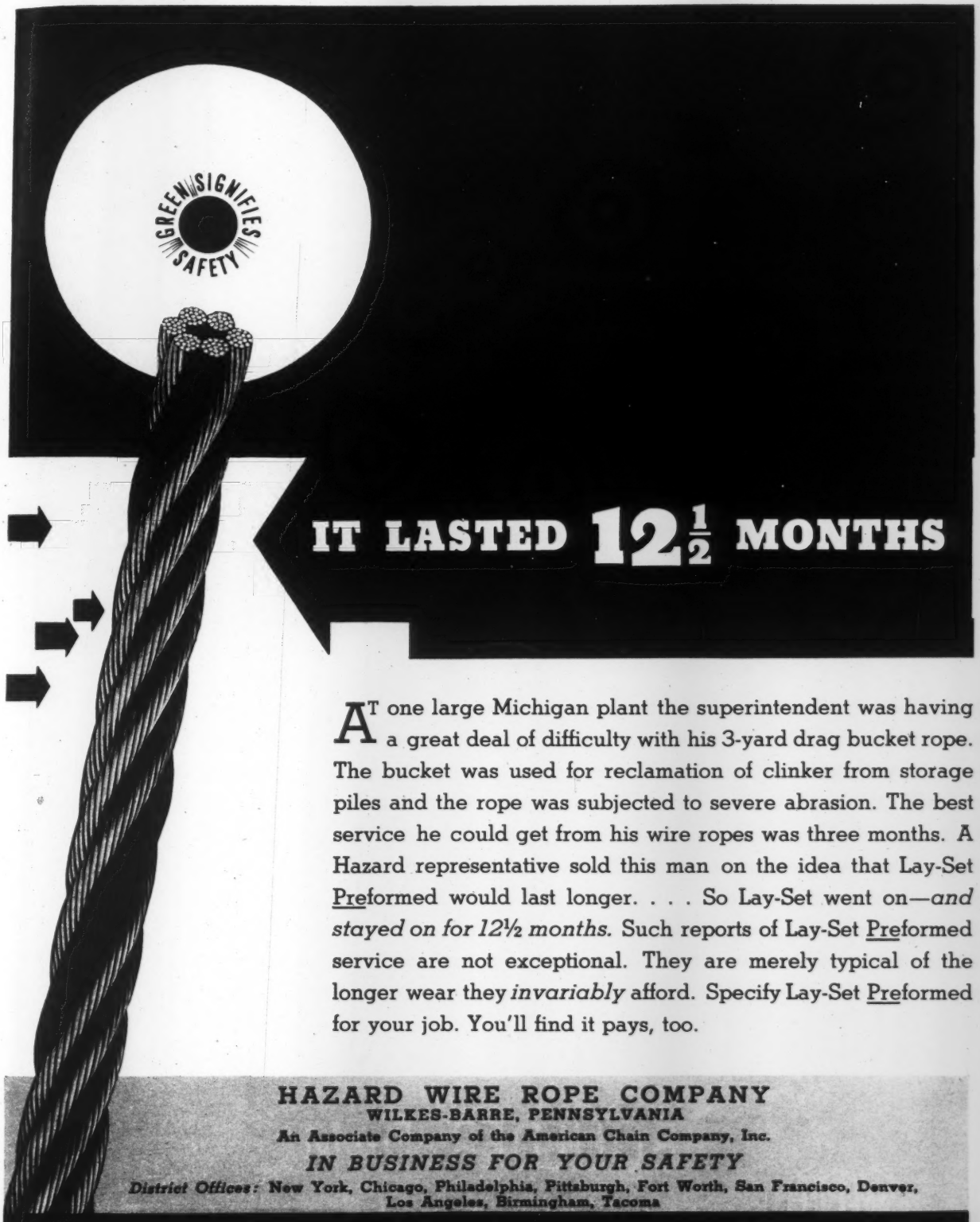

IT LASTED 12½ MONTHS

AT one large Michigan plant the superintendent was having a great deal of difficulty with his 3-yard drag bucket rope. The bucket was used for reclamation of clinker from storage piles and the rope was subjected to severe abrasion. The best service he could get from his wire ropes was three months. A Hazard representative sold this man on the idea that Lay-Set Preformed would last longer. . . . So Lay-Set went on—*and stayed on for 12½ months.* Such reports of Lay-Set Preformed service are not exceptional. They are merely typical of the longer wear they *invariably* afford. Specify Lay-Set Preformed for your job. You'll find it pays, too.

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LAY-SET *Preformed* Wire Rope

ALL HAZARD WIRE ROPES MADE OF IMPROVED PLOW STEEL ARE IDENTIFIED BY THE GREEN STRAND

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Bears for Punishment

6 SMITH TILTERS poured practically all of the 4,364,903 yards of concrete at BOULDER DAM, helping the contractors, Six Companies, Inc. to complete the gigantic project more than TWO YEARS AHEAD OF SCHEDULE.

Today, those same mixers are continuing their splendid work on the Parker and Bonneville Dams. The machines are still in excellent condition, pouring concrete every day on a fast, big production basis.

What bears for punishment! Only the dependable SMITH TILTERS with their easy rolling "End-to-Center" mixing action and fast "tilt and pour" discharge could make such a record. That's real mixer performance.

THE T. L. SMITH COMPANY
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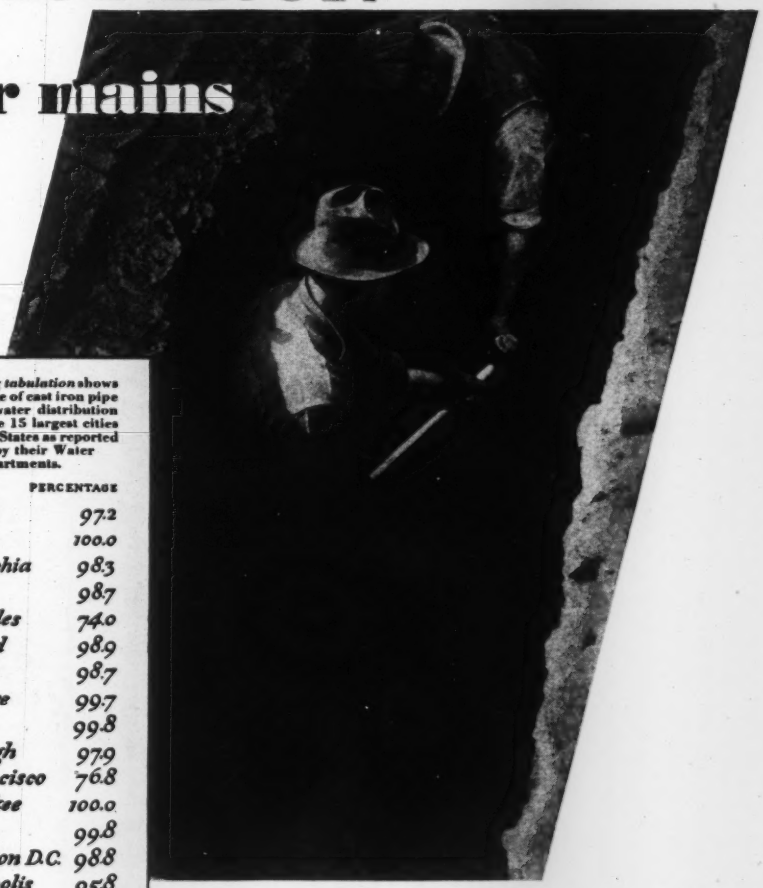
BOULDER DAM
poured by
SMITH MIXERS
USED ON THE WORLD'S GREATEST CONCRETE PROJECTS

Why CAST IRON is the standard for water mains



The following tabulation shows the percentage of cast iron pipe used in the water distribution systems of the 15 largest cities in the United States as reported in 1935 by their Water Departments.

CITY	PERCENTAGE
New York	97.2
Chicago	100.0
Philadelphia	98.3
Detroit	98.7
Los Angeles	74.0
Cleveland	98.9
St. Louis	98.7
Baltimore	99.7
Boston	99.8
Pittsburgh	97.9
San Francisco	76.8
Milwaukee	100.0
Buffalo	99.8
Washington D.C.	98.8
Minneapolis	95.8

When New York City engineers uncovered this 105-year-old cast iron water main to cut in a new valve, their comment was "that pipe looks good enough to last another hundred years."

IT serves longest—costs less per service year—costs little to maintain. Those are the reasons why cast iron pipe is the standard material used almost exclusively for the water distribution mains of our 15 largest cities. In these cities the average age of the oldest cast iron pipe in service is 86 years. Cast iron pipe has by far the longest life of any material practicable for water mains—a fact known by all water works engineers, and through our advertising, by the public whom they serve.

Cast iron is the standard material for water mains the world over. Its useful life is *more than a century* because it effectively resists rust. It is the one ferrous metal pipe for water or gas mains or sewer construction that will not disintegrate from rust. Available in diameters from 1¼ to 84 inches.

For further information, address The Cast Iron Pipe Research Association, Thos. F. Wolfe, Research Engineer, 1013 Peoples Gas Bldg., Chicago, Illinois.

CAST IRON PIPE

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Stays FULL longer
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. . . that stops all trucks from being OIL-THIRSTY

When we developed the Furfural Process to make the New Texaco Motor Oil, we had just one thing in mind . . . We wanted to give truck operators a better and *safer* lubricant.

"Furfural" is a new refining material. When oil is treated with Furfural, a stronger film is produced . . . a film that *resists heat in hot cylinders*. It is called the "Furfural'd Film."

A "Furfural'd Film" is *all lubricant*. All tar and gum forming elements . . . and other non-lubricating materials . . . have been removed. There are no waste products to gum and stick piston rings . . . or to form hard carbon . . . sludge . . .

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It lubricates so completely that wear on cylinder walls, piston rings and bearings is almost eliminated. Greater piston seal is assured. Hence, more complete combustion . . . higher fuel economy.

A Texaco representative will be glad to provide practical engineering service to prove the economies you can get with the New Texaco Motor Oil.

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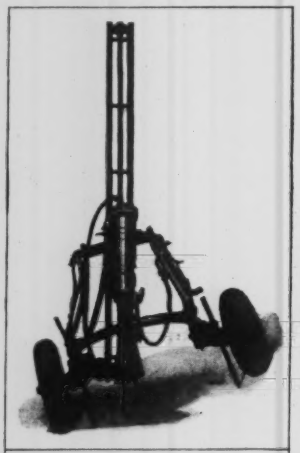
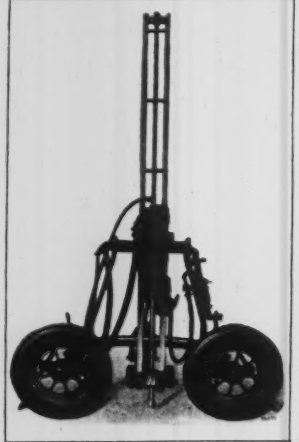
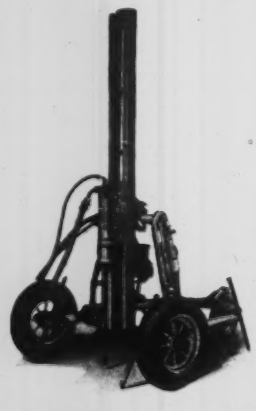
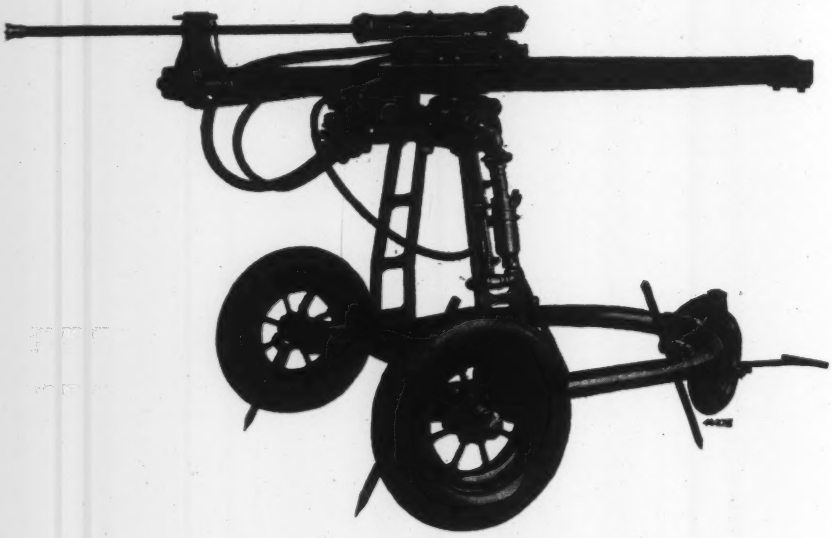
TEXACO

F M WAGON MOUNTINGS make heavy powerful drills as flexible as JACKHAMERS









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3. Its roller-bearing rubber tired wheels and light-weight tubular construction make it easy to move over rough ground.
4. It permits 6-foot changes of steel.
5. It provides the fastest and easiest method of using any of the powerful I-R Drifter Drills.
6. Its air motor-controlled pressure feed represents a distinct advance in the method of feeding wagon-mounted drills.

It permits an infinite range of feed pressure from 1 to 1000 pounds. By means of a self-locking worm drive a small, sturdy and compact four-cylinder air motor automatically feeds the drill up to the rock exactly as with a hand cranked drill. This method prevents the drill from jumping back, thus eliminating the use of unnecessary feed pressure which causes rotation binding. It also prevents the drill from dropping on the operator and keeps the drill from jumping forward in a soft spot or when a steel breaks. This self-locking feature also eliminates all thrust and shock from the air motor.

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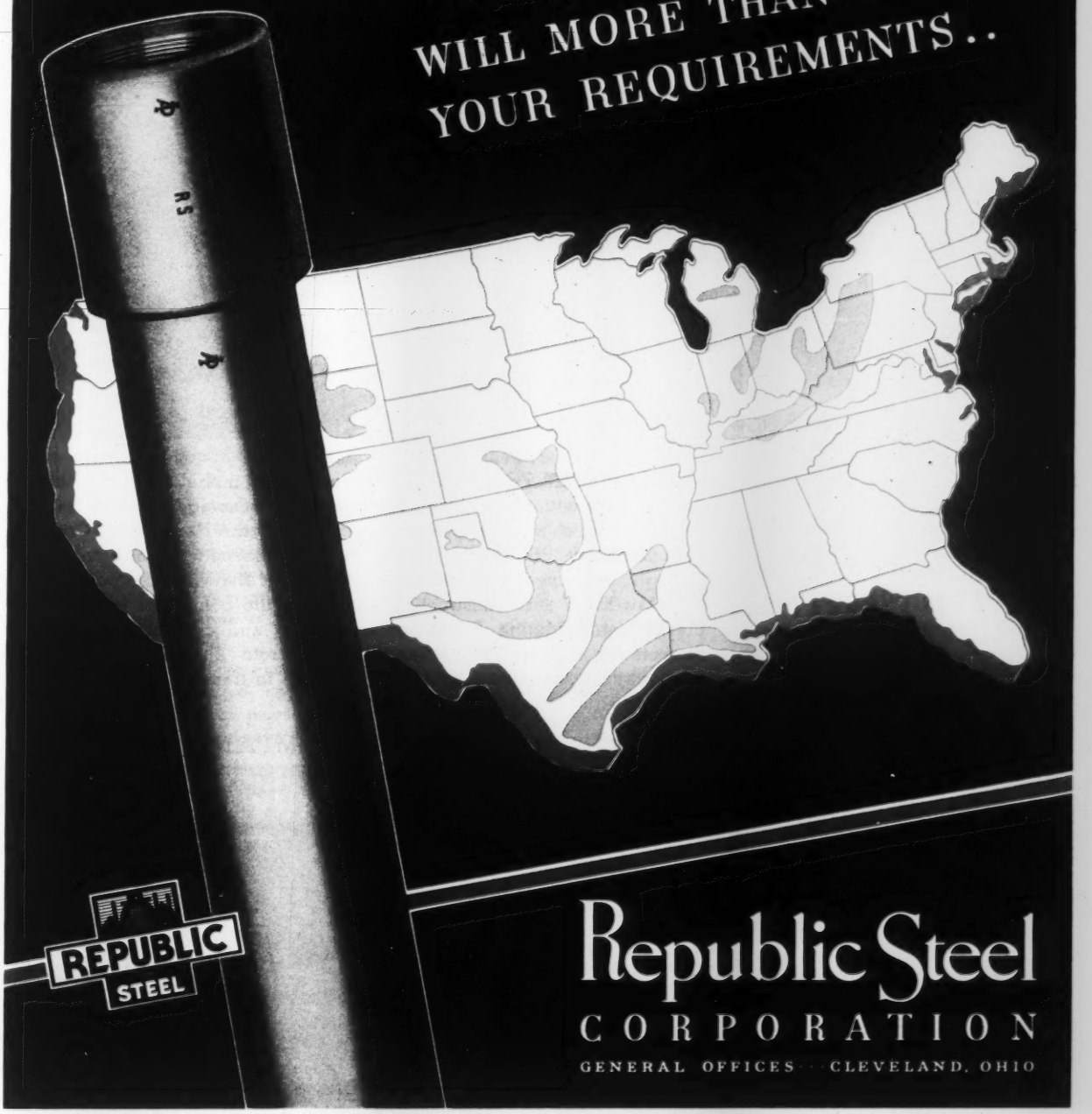

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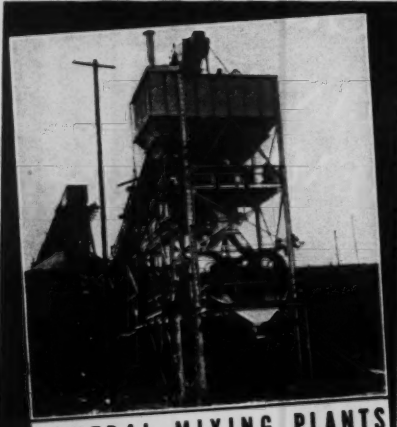
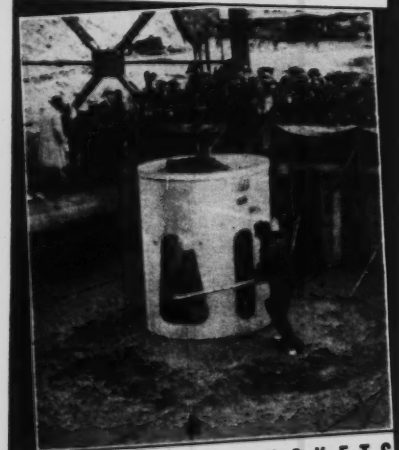
BLAW-KNOX *Aids Construction*

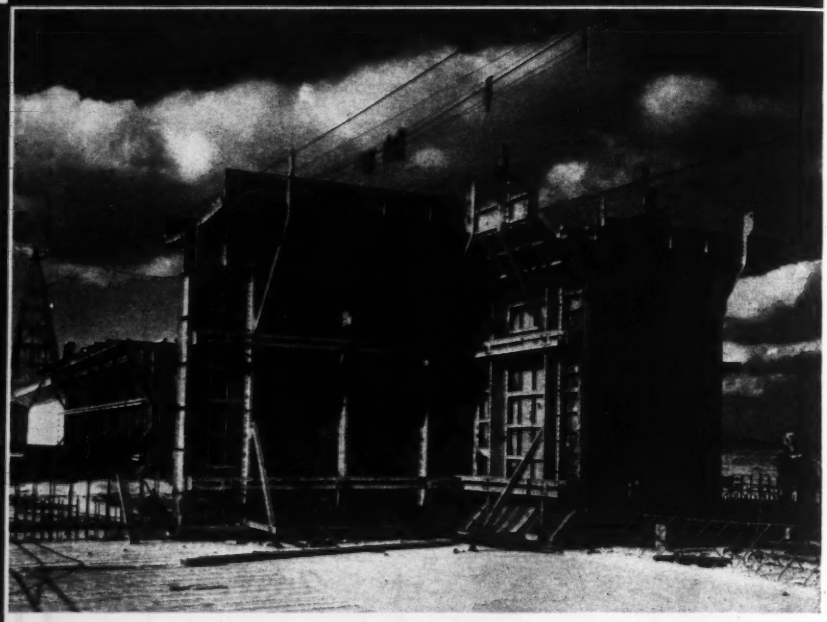


CENTRAL MIXING PLANTS

CLAMSHELL BUCKETS



CONCRETE BUCKETS



Blaw-Knox STEEL FORMS play an important part in the economical and speedy construction of Chicago's Southwest Side Sewage Disposal Plant.

This well co-ordinated job is being built by the Herlihy-Mid Continent Company... one of the thousands of contractors who have profited throughout the years by availing themselves of Blaw-Knox experience.

Blaw-Knox aids construction and helps the contractor with complete Central Mixing Plants for aggregates and cement; Clamshell Buckets for digging and rehandling, Concrete Buckets for placing concrete; Truck Mixers for mixing concrete in transit, and other construction equipment.

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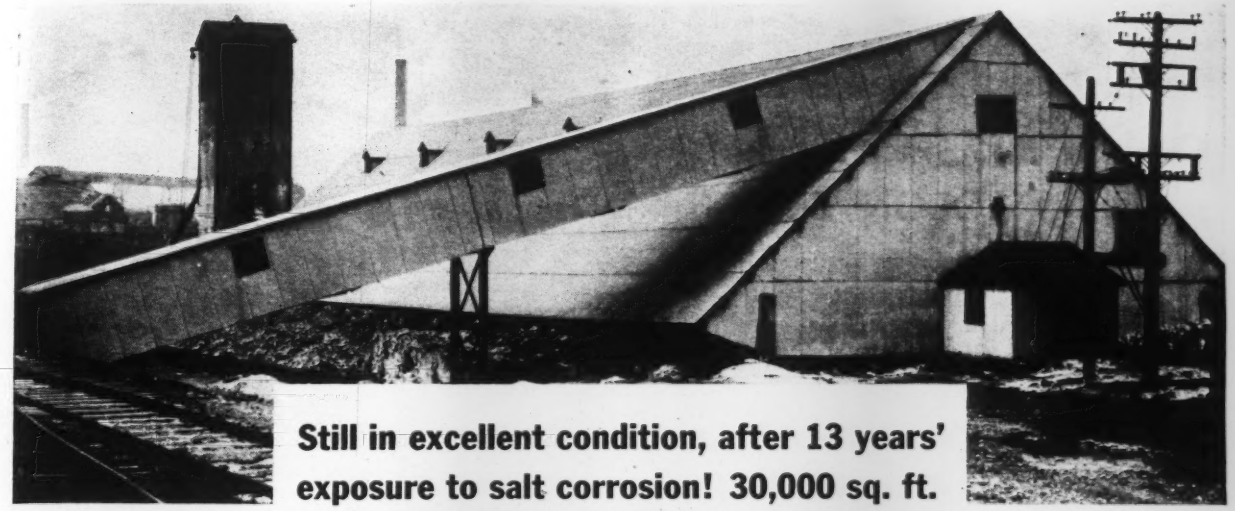

Still in excellent condition, after 13 years' exposure to salt corrosion! 30,000 sq. ft. of J-M Corrugated Transite, in service since 1923 on this storage building at the Detroit Mines of the International Salt Company.

"MORE SALT, please!"

FEW building materials have a taste for salt . . . its corrosive action, especially when damp, is swift and sure.

But Transite . . . as the above record so undeniably proves . . . can "take it." Whether it be in service against salt corrosion, acid fumes or coke gas, Transite Roofing and Siding provide an inherent permanence that is your absolute assurance of lasting protection.

Asbestos-cement in composition . . . molded into unlaminated monolithic sheets under tremendous pressure . . . Transite is fireproof, absolutely impervious to rot and weather, highly resistant to all corrosive agencies. And permanence isn't all. Transite is maintenance-free. It requires no painting—no periodic repairs or replacements. You build with J-M Corrugated Transite and then forget it.

Moreover, erection is simple and rapid. Available in flat or corrugated sheets, Transite can be placed on the roofs or sides of any steel-frame structure as conveniently as wood or metal. For complete details, address Johns-Manville, 22 E. 40th St., N. Y. C.

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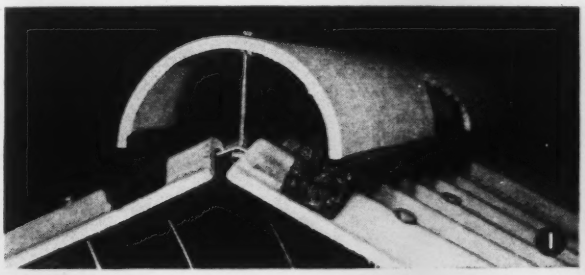

1 Close-up cross section through ridge showing patented "Transfalt Strips" into which the semi-circular ridge piece is inserted at either side, preventing leaks at this heretofore vulnerable point. Elimination of putty makes the entire ridge simple and clean in design.

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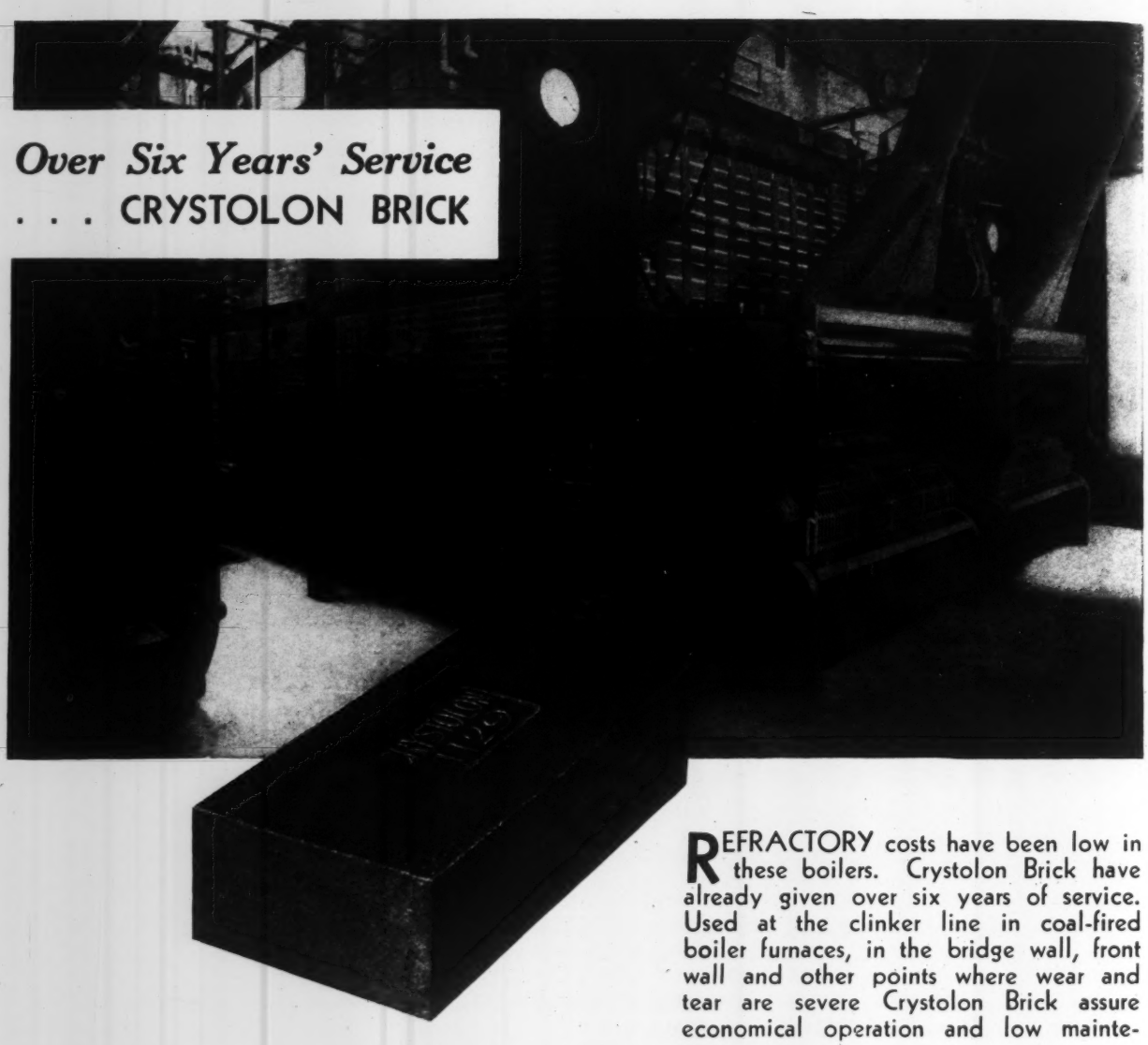

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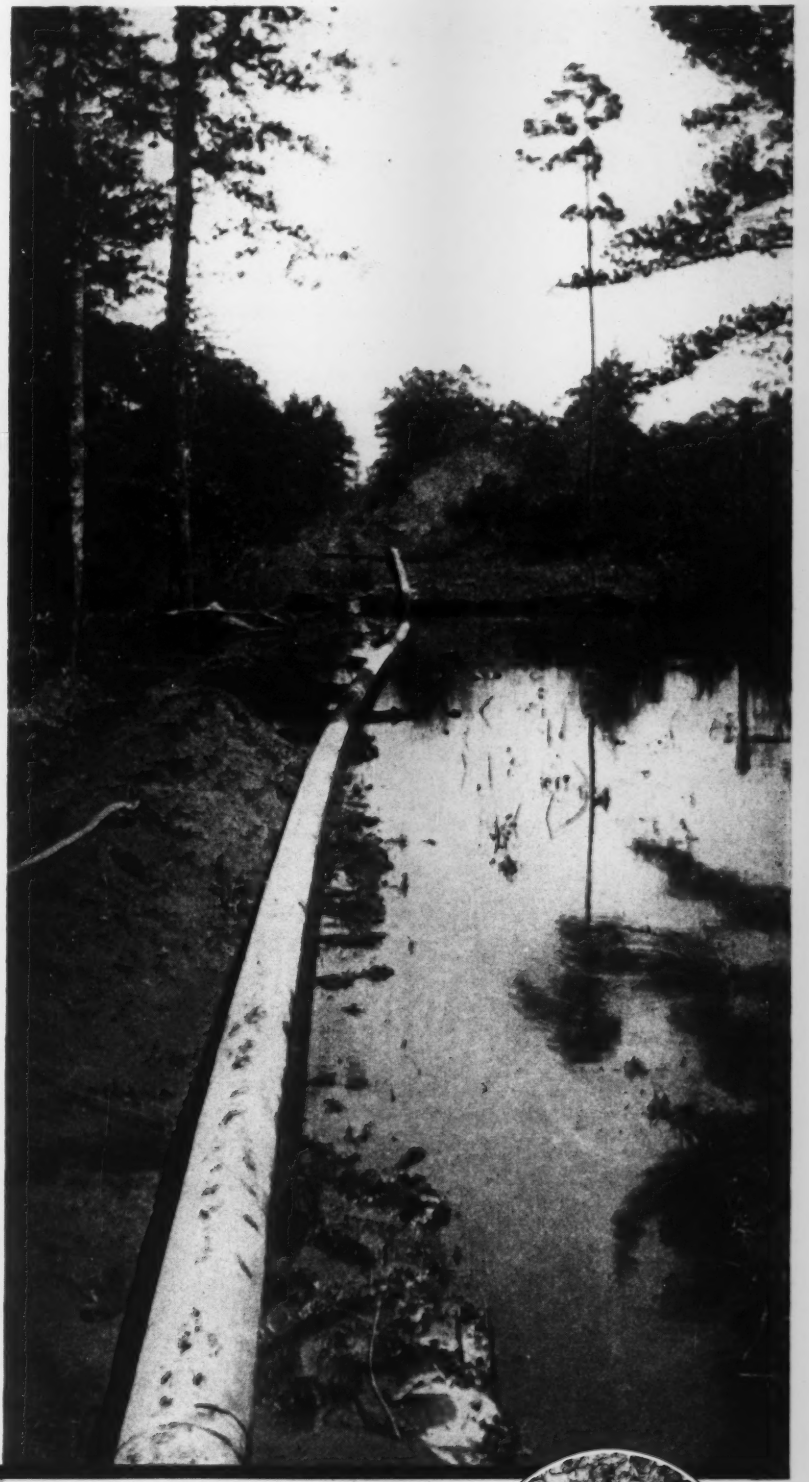

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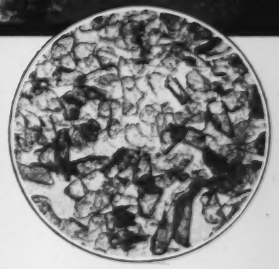
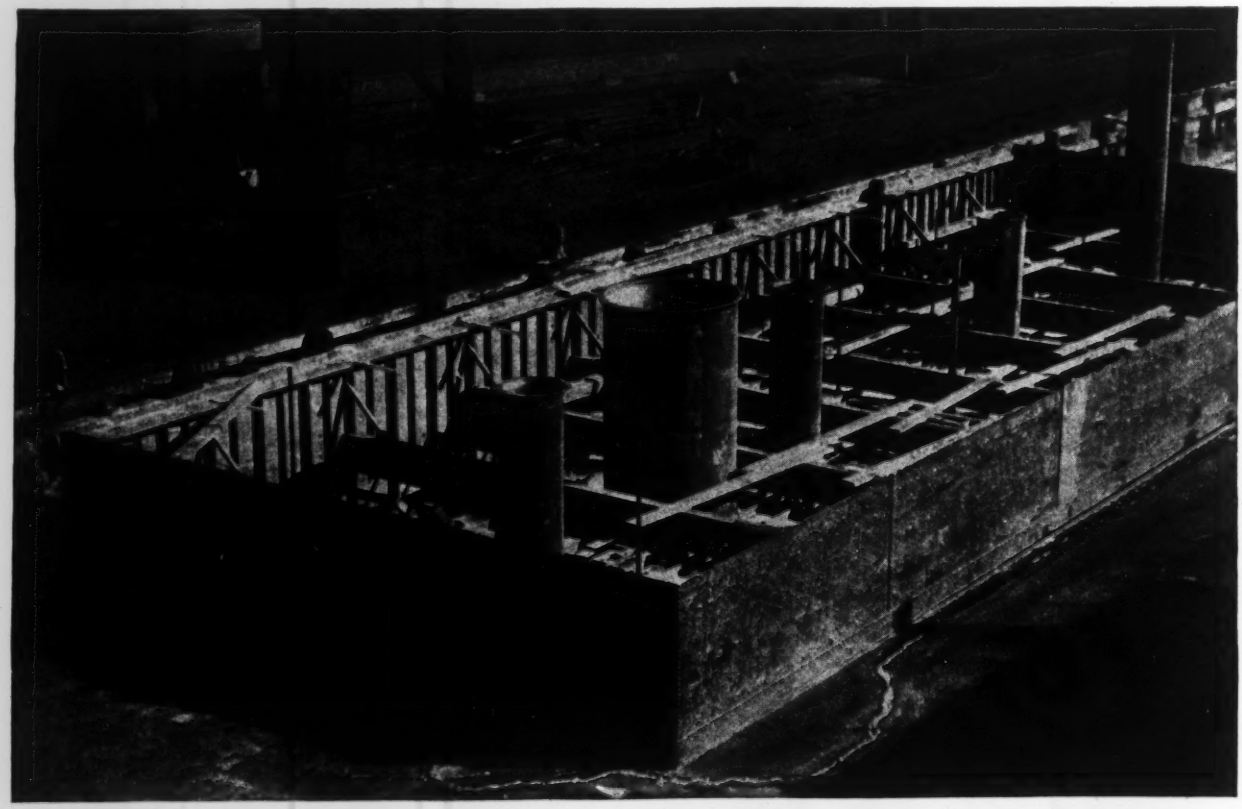


Getting down to **CAISSONS**

SHIPS are only one of the many things we build. Among the Federal miscellaneous products are bridge pier caissons (ready to float into position), curved and bent plate structural steel fabrication, barges, pontoons, dredge booms and spuds, dipper handles, dredge pumps, tunnel shields, stacks, towboat engines, suspension bridge castings, and many other products that involve heavy machining and fabrication.

Think of Federal when you think of things like these. Our experienced organization is well equipped to handle them.

One of the three steel bridge-pier caissons built in 1936 for Senior and Palmer, Inc., associated contractors with J. Rich Steers, Inc., for the Pennsylvania Railroad bridge over the Passaic River at Newark, New Jersey. Caisson dimensions: 36′ x 98′ x 14′



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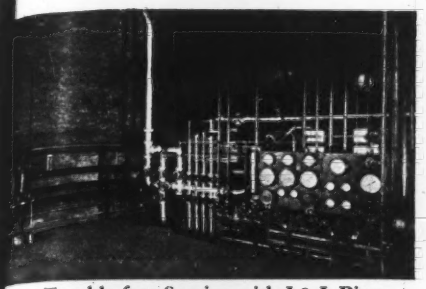

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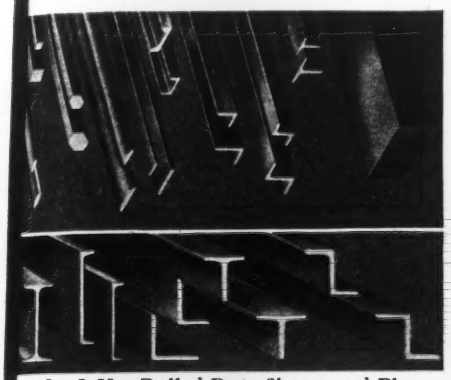

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Jones & Laughlin manufactures a complete line of hot rolled bars, bar shapes, standard structural shapes and plates. The complete line of standard structural shapes, including angles, beams, channels, tees and zees, contributes materially to the ability of J & L to serve the construction industry.

You profit in two important ways when you depend on J & L steel construction products. First, you save time and money because the wide variety of J & L steel products permits you to concentrate your purchases and thus avoid the expense and trouble of separate negotiations with a number of different sources.

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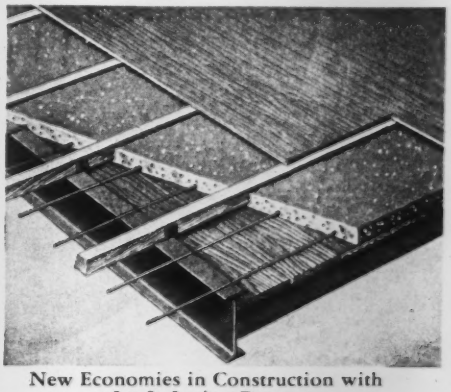
J & L Diamond Bars are made in two types, round equivalent deformed and square equivalent deformed. They are uniform in cross section and true to size, with uniform clean cut and accurate ribs which provide maximum area to insure bond. They are made of new billet steel which assures uniform strength and most desirable bending qualities.



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J&L STEEL

'Fabricated by J & L" means correct design and economical erection

Shown here is one of the Grand Island Bridges spanning the Niagara River at Grand Island, N. Y.—an interesting example of Jones & Laughlin fabricated structural work.

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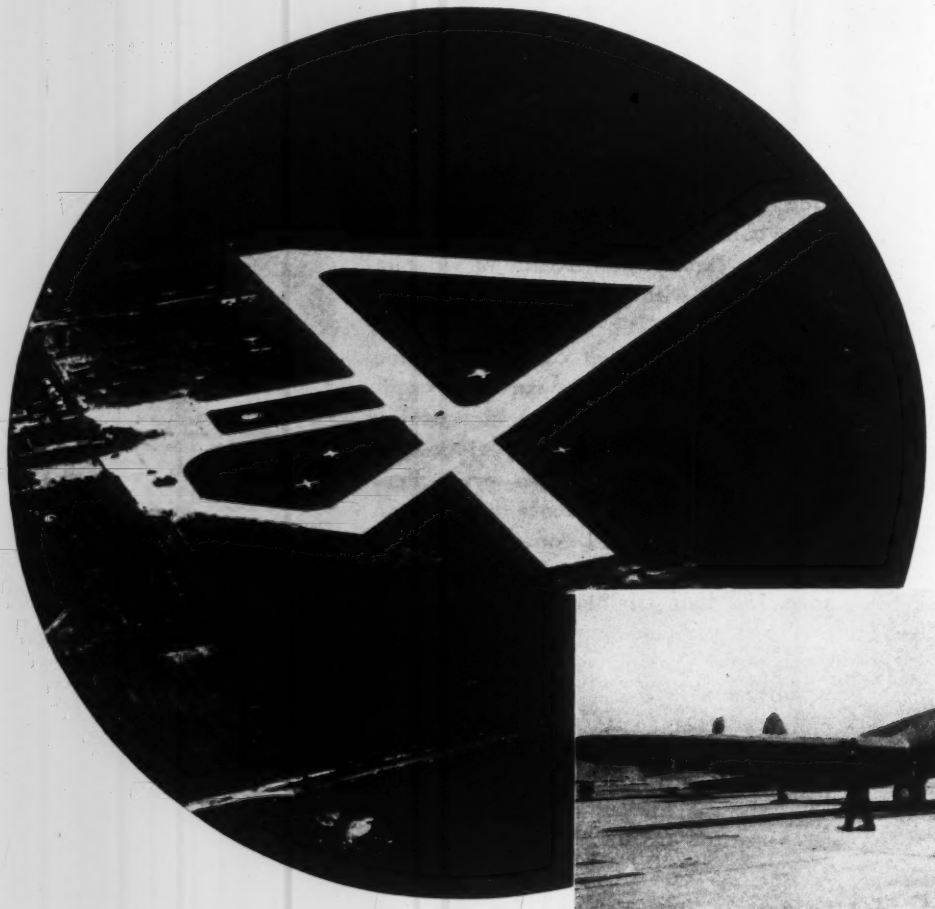

Left—The Indianapolis Airport. These 6-year-old concrete runways are now being extended.

Below—Floyd Bennett Airport at Brooklyn, New York, uses concrete runways and aprons.

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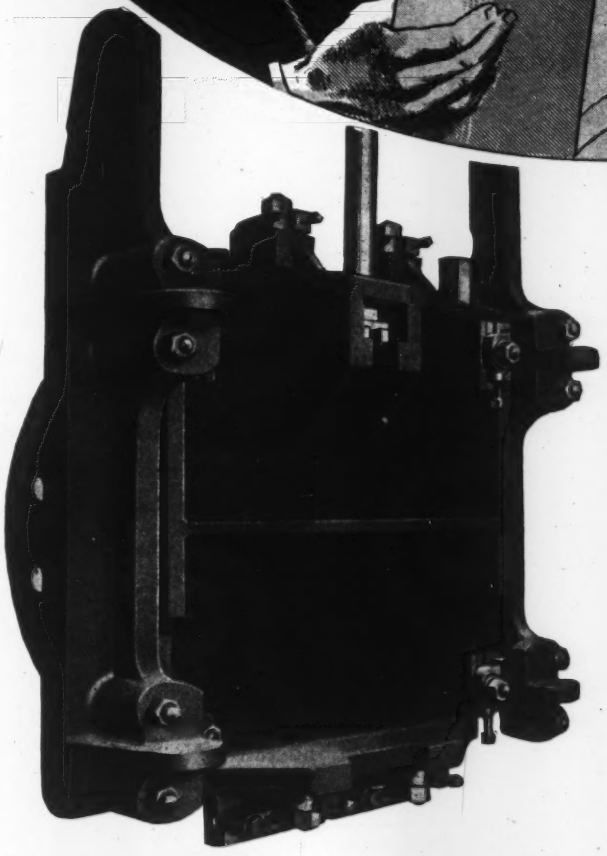

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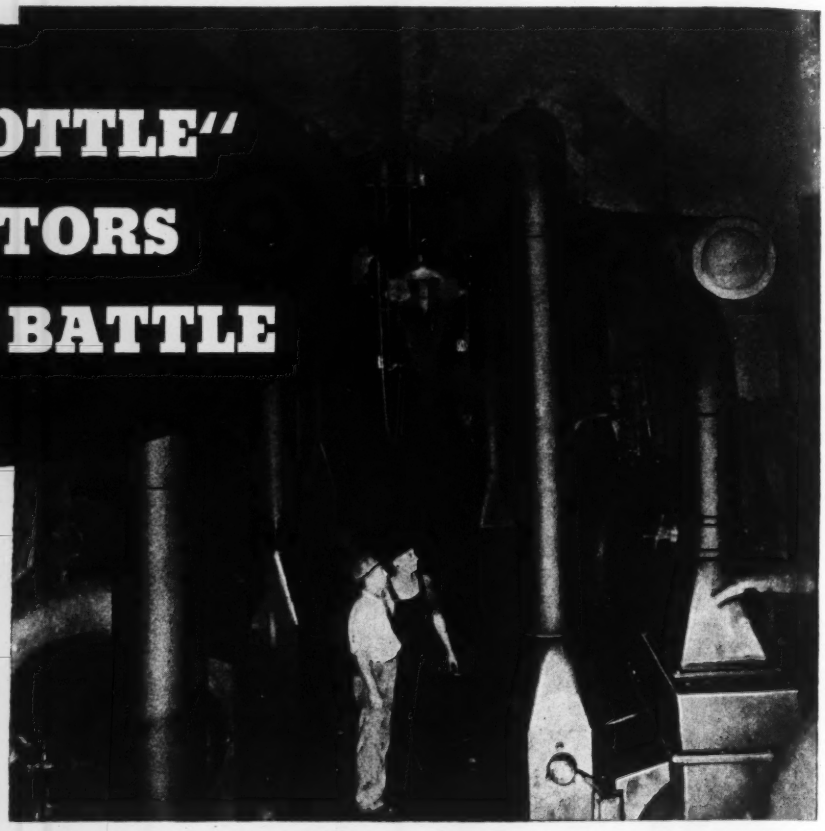
The CHAPMAN VALVE MANUFACTURING COMPANY

INDIAN ORCHARD, MASSACHUSETTS

ONE "BOTTLE" OF MOTORS WON THE BATTLE



In this bottle-shaped cavern, G-E motors direct-connected to 4-stage centrifugal pumps would keep on the job even though Potrero Shaft were completely flooded

"AND then I tried a bottle of 700-horsepower G-E motors."

This is the testimonial that the 800-foot Potrero shaft might well have given. The Potrero shaft is on the San Jacinto Tunnel, part of the 242-mile aqueduct of the Southern Metropolitan Water District of Southern California.

As months stretched into years, water, sand, and mud were balking all efforts to make satisfactory progress in the tunnel. The Potrero shaft had been flooded twice. Sand and mud had repeatedly buried equipment. Dewatering took weeks and weeks, with ordinary small sinker pumps. It looked as though the entire $220,000,000 project would be held up.

Then the engineers hit upon the idea of cutting out a bottle-shaped cavern and installing new G-E forced-air-ventilated motors to drive 4-stage pumps.

In this bottle, with the neck sealed from flood by concrete and steel, the motors could drive the pumps continuously, regardless of the depth of water in the shaft or in the tunnel. The bottle, 95 feet long, was cut into solid granite, and new pumps and motors were installed. They went to work. At times the bottle-shaped pumping station was put to severe test, but it never failed; and the work has gone forward steadily.

Since taking a bottle of G-E motors, there has been a complete cure. General Electric, Schenectady, N. Y.

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An Index for Volume 116, January-June, 1936, will be published with the issue of July 9.

Fighting Snowdrifts in July!—The Best Time to plan a successful campaign against Old Man Winter is in the summer. Next week's issue will contain an instructive account of the methods used by the Bureau of Public Roads in the Rocky Mountain States where the annual snowfall sometimes reaches 600 inches.

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June 25, 1936

FIG. 1—STEEL RIBS and wood lagging support ground for belling out bridge caisson. The bolts carrying the horizontal angle under the upper end of the ribs are fastened to the caisson cutting edge. This section is about ready for concrete.

Steel Ribs Support Bell Base of Deep Bridge Caissons

New method of ground support for belling out large caissons developed on Pennsylvania R.R. bridge foundations at Newark

IN SINKING three large pneumatic caissons for the new Pennsylvania Railroad bridge over the Passaic River at Newark, N. J., the foundation contractor developed a simple but efficient method of supporting the ground for belling out the bottom of the piers. The support system consisted of a series of H-beam ribs driven downward on the plane of the bell roof from inside the caisson. A continuous steel angle, hung parallel to, and a short distance below, the cutting edge supported the upper end of the ribs and formed a slot serving as a guide through which the H-beams were driven. The ribs were driven far into the ground ahead of excavation to support the lower end. Wood lagging placed above the ribs or between the flanges provided the necessary sheeting. This system replaced the usual heavy and cumbersome timber supports formerly used in the belling out process.

The new bridge is being built adjacent to and south of the recently completed three-track structure put into service last year. It is the final major link in the P.R.R. Newark improvements, which have been under way for several years. While the bridge will carry three tracks, the same as the neighboring structure, two parallel lift spans of 240 ft. each form an unusual design of superstructure. One span will carry two tracks of the rapid transit line to Hudson Terminal, New York City, the other will carry one eastbound P.R.R. track, at a different level, to give the Pennsylvania four main tracks across the river. Both spans are on common piers. Each lift span will be independently operated, and control of all three spans will be from an interlocking tower on the east bank.

The substructure for the new bridge consists of five piers, three of them large pneumatic caissons carried to hard pan, the other two founded on piles. The caissons for the two main piers supporting the lift span towers are 36x98 ft. in plan, the third is 24x87 ft. All three caissons were sunk to El. —60 (mean water level is El. 9). After the caissons were landed excavation was continued an additional 6 ft. of depth, extending outward beyond the cutting edge 7 ft. for the two large piers, 5 ft. on the smaller pier. The sides of the bell slope downward from the cutting edge of the caisson to a vertical cut 1 ft. high at the floor. To lighten the load on the foundation several hollow sections were built into each pier above El. —46. Design of one of the large piers is shown in Fig. 3.

Steel and wood caissons

For a height of 14 ft. above cutting edge the caissons were steel, these sections being fabricated at the Federal Shipbuilding & Drydock Co. shipyard and floated to the job. The steel sections included the working chamber, 6½ ft. high, roofed with a 7½-ft. concrete slab over a steel plate ceiling. The remainder of the caisson was framed timber with solid wood sheathing.

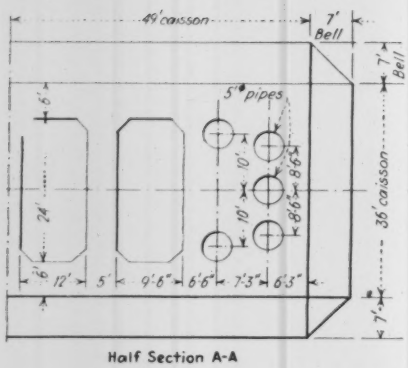


FIG. 2—CAISSONS 36x98 ft. in plan were required for the two main piers; the third caisson was somewhat smaller.

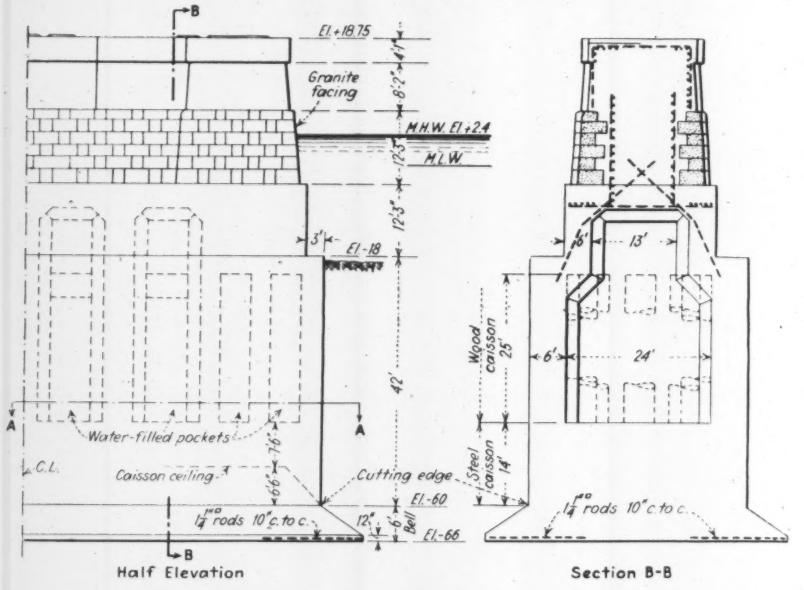
There were four muck shafts, with revolving door locks, and one man shaft with double-deck man lock in each caisson. All shafts were 36-in. riveted steel pipes. Muck was removed in the cylindrical buckets hoisted by individual air motor hoists at each muck lock.

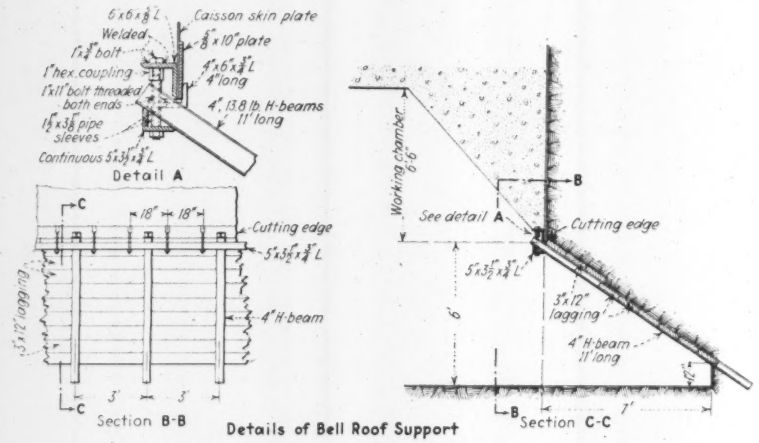
All reinforcing bars for the bell mat, and beams and angles for the bell support, were fastened to the working chamber ceiling in four sets, neld by a cradle of angle bars bolted to the roof. These were placed at the shipyard during fabrication of the steel shell, and rode down with the caisson undisturbed.

Bell roof supports

The cutting edge of the caisson consists of a 6x6x$\frac{5}{8}$-in. angle fastened to the inside of the skin plate, horizontal leg upward and turned inward. Along the bottom of the outside of the skin plate is a $\frac{5}{8}$x10-in. stiffening plate. At the time of fabrication of the shell holes were drilled 18 in. apart through the outstanding leg of the cutting edge angle to receive 1x1$\frac{1}{4}$-in. bolts. These bolts, inserted from above, were welded at the head to the top face of the angle.

After the caisson reached bottom, the assembly to hold the upper end of the bell roof support was prepared. First, each of the short bolts protruding through the bottom angle was extended by splicing on a 1x11-in. bolt, threaded both ends, by means of a hexagon coupling. Then a 4x6x$\frac{3}{4}$-in. clip angle, 4 in. long, with a hole drilled through the long leg, was slipped over the bolt, the vertical leg being hooked under the cutting edge in a small pocket dug out of the clay. The top of the outstanding leg of the clip angle bore against a short pipe sleeve separating it from the coupling. Another pipe sleeve was slipped over the bolt below the clip angles, and then continuous lengths of 5x3$\frac{1}{2}$x$\frac{3}{4}$-in. angles, with holes bored in the long leg, were fastened to the bolts, the vertical leg of the angle being turned inward and upward.





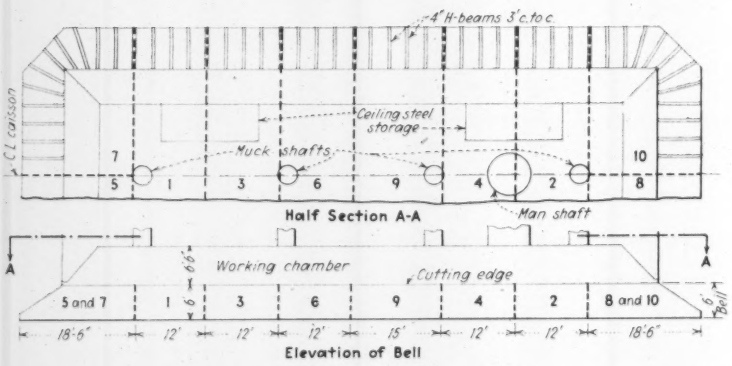


FIG. 3—DETAILS of ground support for the bell. In addition to the ribs as shown, occasionally a shorter rib was inserted between the 11-ft. beams if soft ground required additional support.

The assembly is shown in detail in Figs. 3 and 4. It provided a rigid support for the free ends of the bell roof beams, and a three-point guide for driving these beams. The roof beams are 4-in. H. sections, 13.8 lb., 11 ft. long, spaced 3 ft. apart.

The process of belling out was not started until the caisson had been landed in final position and the bottom excavated to cutting edge level. Then the working chamber was divided into transverse strips from 12 to 15 ft. wide, so located that each strip could be served by a muck shaft. One at a time,

FIG. 4—DETAILS of the bell ground support. Left—Angle support for free end of ribs; Center—Lagging in place; Right—H-beam ribs being driven down ahead of excavation.

FIG. 5—OUTSIDE plant for sinking included four muck locks, one man lock and self-dumping barges for disposal of muck. Concrete was poured through the muck locks from a floating plant.

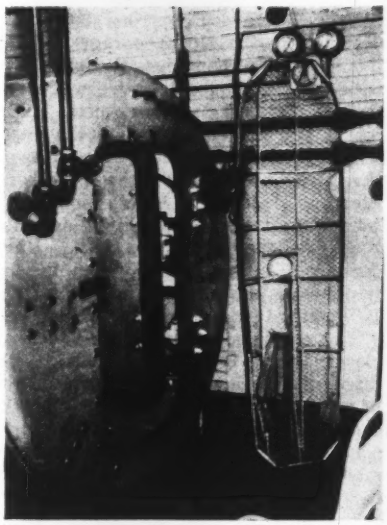


FIG. 6—SAFETY was a feature of the compressed air work. This view shows the end of the medical lock and a vertical stretcher for hoisting an injured worker up the manshaft.

each strip was excavated to a depth of 6 ft. below cutting edge the full width of the caisson.

At each end of the cut was the sloping roof of the bell. Here the steel ribs were driven down ahead of excavation, the webs in a vertical plane. Close to the cutting edge the 3x12-in. wood lagging could be slipped into place over the tops of ribs, but lower down they were inserted between the flanges, resting on the top of lower flange. A view of a supported section of bell roof is shown in Fig. 1. Occasionally, when ground conditions demanded more support than afforded by the 3-ft. spacing of ribs, auxiliary ribs about 6 ft. long were driven between the others, extending only part way down from the cutting edge. Then, too, sometimes it was necessary to brace the ribs with a post at mid point.

After excavation of a bell strip was completed, the trench was immediately filled with concrete to the cutting edge level. Concrete was locked through special concrete locks at the top of the muck shaft, and dropped free a distance of 80 ft. to the bell floor. A mat of 1¼-in. square bars was placed in the bottom of the trench prior to concrete placement. The bell pour amounted to 117½ cu.yd. for a 12 ft. section; 147 cu. yd. for a 15-ft. section.

Fig. 3 shows the order of excavating and concreting of the bell strips. The end sections of the caisson were divided into two strips each, so only one corner of the box was exposed at one time. This was done to reduce the loss of air through a too wide an expanse of sloping bell roof.

The caissons were sunk in the remarkably fast time of 2 to 2½ ft. per day, though some days a progress of 3 ft. was made. Work was carried on 24 hours a day, six days a week.

On Feb. 7 the first steel caisson for the smaller pier was received on the job, but because of bad weather delaying delivery of other material, air was not put on this caisson until March 2, and it was sealed March 25. The second caisson was delivered March 6, air turned on March 16, and it was sealed April 15. The third caisson was received April 6, was put under air April 13 and sealed on May 19. On the large caissons the excavation ran 130 cu.yd. per ft. of depth; the concrete seal required 850 cu.yd. of concrete.

The compressor plant consisted of eight large stationary low-pressure units, of which four were oil-engine driven; the remainder electric motor driven. The oil-engine units were in constant use, the others were used when additional air was required. Three large gas-driven portable compressors furnished high air pressure for the air hoists, drills and spades. Concrete was supplied by a floating tower plant, fed by barge delivery of cement and aggregates, the mixed concrete being chuted from the tower to airlocks.

Direction

The bridge is part of the Pennsylvania Railroad's Newark improvement program being carried out under the direction of A. C. Watson, chief engineer, New York Zone, T. W. Pinard, engineer of bridges and buildings, and L. P. Struble, engineer of Newark Improvements. Charles S. Landers is consulting engineer on foundations for the railroad. The general contract for the bridge substructure and approaches is held by J. Rich Steers, Inc., New York, John Malcolm, superintendent in charge. The pneumatic caissons were sunk by Senior & Palmer, Inc., New York, under the supervision of J. F. Armstrong.

Cities Without Water—I

FIG. 1—THE WORST FLOOD in history put Pittsburgh's water supply out of commission, creating a grave emergency.

Pittsburgh's Waterworks Failure During the Flood

By Geo. L. Hendrickson
Assistant Managing Engineer, Bureau of Water, Pittsburgh, Pa.

FAILURE OF THE WATER SUPPLY is one of the greatest catastrophes which can befall modern municipalities. In time of flood, when other essential services are disrupted and the community is laboring under the stress of disaster, a shortage of water is all the more serious. During the recent Pennsylvania floods the water supply systems of Pittsburgh and Harrisburg failed through submergence of pumping plants at a time when each city was stricken by the worst flood on record. How did these cities meet the emergency? How did they carry on during the period of water shortage? How were the disrupted services restored to normal? What are the plans for protection against future floods? The answers to these questions make a most interesting story of waterworks operation. The story is told in two parts, by those who were intimately associated with the emergency, vividly portraying the various problems that arose and how they were met. The first article details Pittsburgh's experience. Next week the second article will tell of Harrisburg's water famine.
—EDITOR.

ST. PATRICK'S DAY in 1936 will long be remembered in Pittsburgh as the zero hour of the great flood. Waters of the Monongahela and Allegheny rivers and their tributaries, fed by hard rains and melting snows in high reaches of the west slope of the Allegheny mountains, left their banks and engulfed the city, eventually rising to the highest level on record, a 46-ft. stage on the local gage. The water system of the city failed when main pumping plants were flooded, aggravated by failure of electric power essential to operation of the waterworks plants. The situation was made more serious by a breakdown of communication and transportation systems, which complicated and hampered rehabilitation of water service. For several days the city was without water, except in some isolated lowlying sections, and the emergency period of water conservation extended for several days longer.

Flood stage, 25 ft. at the gage at the junction of the Allegheny and Monongahela Rivers, was passed at 8 a. m. Tuesday morning, Mar. 17, and at 6 p. m. that day a stage of 31.6 ft. was reached; a crest of 37 ft. was predicted by the U. S. Weather forecaster. This predicted stage, within 1.7 ft. of the highest water experienced in Pittsburgh since the flood of 1763, was ultimately exceeded by 9 ft. Normal low water stage is 9 ft. on the gage.

Pittsburgh water system

The essential elements of Pittsburg's municipal waterworks system, which supplies a population of 700,000, are shown in Fig. 2. The supply is from the Allegheny River 8 miles upstream from the Point, where the Ross pumping station, located on the north side of the river near the intake, delivers raw water to sedimentation basins of a slow sand filtration plant. The water flows by gravity through the filtration plant and into a 50,000,000 gal. filtered water reservoir, located on the north river bank 2,500 ft. downstream from Ross station. The Aspinwall pumping station, located on the north bank of the river just east of the filtered water reservoir, has an installed capacity of 80 m.g.d. in vertical, triple expansion pumping engines. It takes a supply from the filtered water reservoir and delivers it through a 60 in. steel pipe line to the Lanpher reservoir, one of three primary reservoirs, which serves the north side of the city, north of the Allegheny and Ohio Rivers. One secondary pumping station, the Howard St. station, takes its supply from this system and delivers it to the two high pressure zones of the north side.

A twin 72 in. pipeline crosses the Allegheny River from the filtered water reservoir to the Brilliant pumping station. Six electrically-driven pumps at this station raise the water to the other two primary reservoirs, known as Highland reservoirs No. 1 and 2. The No. 2 reservoir supplies the area south of the Monongahela and Ohio rivers, the downtown area and other lower parts of the district between the two rivers. It is at the same elevation as the Lanpher reservoir and the two distribution systems are connected by a 48-in. pipeline under the river and two 24-in. pipelines supported on the Manchester bridge. The Mission St. secondary pumping station draws from Highland No. 2 piping system and supplies the high pressure zone of this area.

Saline secondary pumping station also draws from the No. 2 storage and delivers to the populous Squirrel Hill residential area at the extreme end of the Herron Hill pressure zone. Highland reservoir No. 1 supplies the intermediate-pressure zone in the triangle directly, and through the Highland, Herron Hill and Lincoln secondary pumping stations, the high pressure zones in the peninsula. The Ross, Aspinwall and Brilliant pumping stations were designed to withstand the 1907 record flood stage of 37.6 ft.

The predicted stage of 37 ft. was so close to the 1907 record that it demanded a most watchful attitude on the part of the men responsible for the care and operation of the waterworks plant, and immediate preparations were made for keeping flood waters out of the Ross and Aspinwall pumping stations. Both of these plants have steam driven pumps, but they also have a large amount of electric-drive auxiliary equipment with steam-driven direct-current generators to provide the power for their operation.

Pumps shut down

Before midnight on Mar. 17 it became evident that the predicted crest would probably be exceeded. All available forces were mustered, to install and operate additional sump pumps and to bulkhead openings through which

water was leaking into the station. At 2 a. m., Mar. 18, water had risen in the Ross pump pit high enough to float the oil out of the pump bearings. The pumps were shut down and, to prevent damage to the filtered water reservoir from the upward pressure of flood waters, the pumps at Aspinwall and Brilliant were also shut down. The storage in the sedimentation basins was held so as to raise the water level in the filtered water basin, to balance the rising flood waters. The water rose so rapidly, however, that it overtopped the barricades at 8 a. m. Mar. 18 and both the Ross and Aspinwall stations were flooded. The filtration plant, however, was above the flood crest.

At the height of the flood, the water reached El. 749 (Fig. 4) at the Ross pump station, covering the pump and boiler room floor by 8½ ft., and at Aspinwall by 4½ ft., with 25 ft. of water in the pump pits in both cases. All of the pumping units, generators, the switchboard, and boiler and pump auxilliary motors and equipment at Ross were submerged.

Little concern was felt for the equipment at Brilliant because it was designed for safety from floods 6 ft. above the 1907 record. On Wednesday morning, Mar. 18, however, it became evident that the crest forecasts were at serious variance with the facts. The small electric-drive sump pumps were coping successfully with the leakage until the flood waters reached a stage of 40 ft. The water then began to rise slowly in the piping basement, a room 8½ ft. deep below the operating pit floor. Emergency sump pumping equipment was procured and basement windows and area-ways were bulkheaded, but the river rose above the tops of winow area-ways before the bulkheads were completed. The emergency pumps were put into action within 5 min. of the time when the Duquesne Light Company's last power plant was submerged and the power, upon which the electric sump pumps depended, failed. This was 4 p. m., Mar. 18. The two emergency pumps were able to hold the water in the piping pit to a slow rise, but additional pumps were ordered.

Traffic in the city was so congested that 6 hours were required to get an additional pump delivered. In the meantime one of the window bulkheads, which had been placed under water, broke and the water poured into the building. This break was repaired and the sand bags were chinked with sod dug from the lawn which again brought leakage under control. The river continued to rise until 8 p. m., Mar. 18, when the all-time record crest of a 46 ft. stage was reached.

Preparations had been made for bulkheading the doors, and sand and sod were brought into the building which was entirely surrounded by water but, fortunately, the crest was reached when the water was still 13 in. below the door sills. When the window bulkhead broke, the water in the piping basement rose to El. 731, which is 3 ft. below the operating pit floor upon which the three 2,250 hp. and three 1,500 hp. motor-driven pumps, with their exciter sets, starting reactors and circuit breakers were located. The flooding and consequent short circuiting of all this equipment would have delayed the recovery of the Pittsburgh water works greatly and would have caused a far more serious water shortage than was actually experienced.

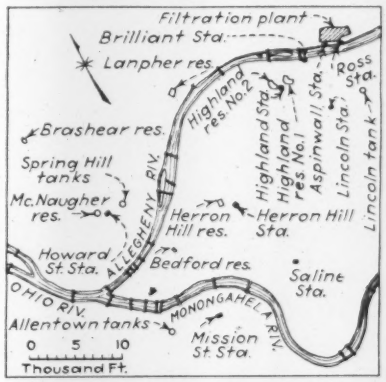


FIG. 2—MAP OF PITTSBURGH'S pumping plants and distribution reservoirs. All three pumping stations failed through submergence.

On Wednesday morning, the Ross and Aspinwall pumping stations were flooded and entirely surrounded by the river. No water could be supplied to the filtration plant or pumped to the primary distribution storage reservoirs. Secondary pumping stations continued to pump to the smaller secondary reservoirs and tanks until the power failed. The Howard St. secondary station lost power at 6 a. m.; Saline at noon; all of the other electric-drive stations at 4 p. m. on Wednesday. The power company restored service by interconnection with other companies to the Brilliant, Lincoln and Herron Hill secondary pumping stations at 9:30 a. m., Mar. 19. Howard St. secondary station received power at 9 p. m. Mar. 20, and the Saline station on Mar. 21.

Emergency rehabilitation

On Thursday afternoon, Mar. 18, the water had receded sufficiently to permit sump pumps to be started to unwater the Ross station. The mayor and the city council authorized emergency expenditures for rehabilitation, and forces were hired, organized and put to work to get the Ross station into operation without delay. As Ross was the key upon which resumption of service depended, energies were concentrated there. The equipment to be rehabilitated includes two large high-pressure boilers with electric-drive stoker and forced draft fan, with alternate water-motor drives; six spare boilers; two steam turbine-driven and one electric and water-motor-driven boiler feed pumps; one motor-driven coal crusher and three motor-driven coal and ash conveyers; one 100 m.g.d. high-pressure steam-turbine-driven pump with an electric and water motor-driven condenser pump; one 50 m.g.d. high pressure steam-turbine-driven pump; one 100 m.g.d. spare steam-turbine-driven pump; two smaller steam-driven pumps for spare service; one electric and water-motor-driven hotwell pump; one 200 kw. steam-turbine-driven d. c. generator with electric-motor-driven condenser pump; three 175-kw. steam-engine-driven d. c. generators with electric-motor-driven condenser pump; water softeners and feed water heater; switchboard, starting equipment and switches for electrical machinery.

The labor force and equipment of the John F. Casey Co., a contractor whose yard abuts the Ross property, were utilized, together with city forces, to unwater the building, disconnect electric motors and generators and deliver them to the nearest shop where they could be dried out and repaired, and to remove the mud from the building, boilers, and ash tunnel. This work was started at noon, Thursday, when the water had receded sufficiently to allow the installation of additional temporary sump pumps and piping. Workmen outside the regular city forces were called in and the work was attacked at all points. One crew disassembled the bearings on the pumping units. Oil reservoirs had been fouled and were cleaned thoroughly and refilled. The mud, of course, completely covered all parts of the machines and had to be removed very thoroughly to prevent bearing trouble. Another crew repaired steam lines, in which three 10-in. valves had been broken by rapid cooling. Another crew prepared the boilers for service, and at noon, Mar. 20, a slow fire was built to dry out the brickwork. A separate force of electricians made and set up a temporary switchboard and erected and connected the new temporary switches and equipment. Direct-current starter coils were dried out in place, tested and rewired where necessary. In all, about 30 motors ranging from 50-hp. to 3-hp., in addition to the four generators, were damaged at the Ross station.

Fortunately alternate water-motor drives were available on boiler feed pump stokers, forced draft fans and condenser pumps, and the station was put into operation, without induced draft, about 12 hr. before the electric generator had been dried out, returned to the station and reconnected.

Precious time was lost and many extra miles of travel were required by the failure of telephone communication and by traffic restrictions. Materials were located largely by automobile messenger and hauled by city trucks, passed through restricted traffic zones.

The work had progressed sufficiently

on Saturday, Mar. 21, so that the old 50-m.g.d. low pressure steam-engine pump was started at 10 a. m. The principal pumping unit, a 100-m.g.d. high pressure steam turbine unit, was put in service at 5:40 p. m. on the same day. The sedimentation basins were filled sufficiently to permit filtration to be started at 4 p. m., and sufficient storage in the filtered water reservoir made it possible to start a 28-m.g.d. pump at Brilliant at 7:15 p. m. At 8 p. m., Saturday, three pumps at Brilliant were on the line, and water at the rate of 90 m.g.d. was being pumped to the two Highland reservoirs.

The rehabilitation of the Aspinwall station proceeded concurrently with that at Ross, but the latter was given preference because of its greater importance. At 4:40 p. m. Sunday, Mar. 22, the pumps at Aspinwall were started, and the emergency rehabilitation job in its first phase of providing means of getting water into the reservoirs was well under control.

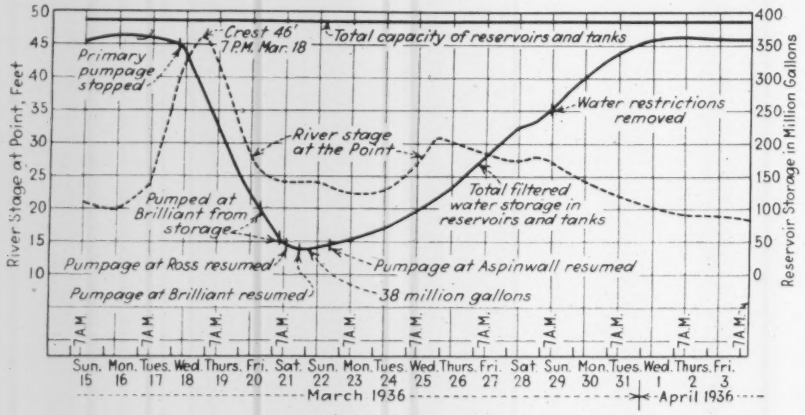

Crest 46'
7 P.M. Mar. 18
Total capacity of reservoirs and tanks
Primary pumpage stopped
Water restrictions removed
River stage at the Point
Pumped at Brilliant from storage
Total filtered water storage in reservoirs and tanks
Pumpage at Ross resumed
Pumpage at Aspinwall resumed
Pumpage at Brilliant resumed
38 million gallons
River Stage at Point, Feet
Reservoir Storage in Million Gallons
Sun. Mon. Tues. Wed. Thurs. Fri. Sat. Sun. Mon. Tues. Wed. Thurs. Fri. Sat. Sun. Mon. Tues. Wed. Thurs. Fri.
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3
March 1936
April 1936

FIG. 3—GRAPH of flood stages and reservoir storage. By the time pumping was resumed the storage was down to less than one-tenth of normal.

When the Ross pumps were stopped at 2:15 a. m. Mar. 18, there was a total of 350 m. g. storage in the distribution reservoirs and tanks. An additional 21 m. g. was withdrawn from the filtered water reservoir by pumpage at Brilliant on Mar. 20 and 21, by which time power had been restored for all but two of the electric driven pumping stations and the river had receded sufficiently that it was safe to lower the water level in the filtered water reservoir. This windfall became available when the Highland reservoir No. 1, which it replenished, had but 15 in. of water left.

Operation during emergency

Operation during the crisis was based on following principles: First, warning consumers of approaching shortage and necessity of boiling all water taken from other than the city's supply; second, curtailment of all waste and uses that were not absolutely essential; third, the distribution of the stored water by means of secondary pumpage and piping cross connections between the nine pressure zones so that it would be apportioned fairly; fourth, cooperating with the city highway bureau and the Red Cross to establish tank wagon service for hilltop communities and for institutions that were out of water; and fifth, maintaining sufficient reserve in storage to assure boiler and power water for operating steam driven stations and those containing hydraulically-operated equipment.

A system operation organization, on continuous duty, was set up in the water bureau headquarters, working in collaboration with the department of public works. This office was in communication with all pumping stations, reservoirs and pipeline activities either by telephone or by automobile messenger, and acted as a clearing house for all operating orders. Hourly readings of all reservoir levels were received and recorded and were the basis of determining secondary pumpage, after power became availbale, and of releases from higher to lower pressure zones.

A corps was organized to patrol the flooded district to curtail the use of water, especially to prevent overanxious building owners from using the scant water supply for cleaning purposes. These restrictions were relaxed gradually after primary pumping was resumed and a reasonable storage restored in the reservoirs. Another corps attended to rationing large consumers outside of the city, allowing each consumer to draw only at stipulated hours and in the presence of an inspector.

After primary pumpage was resumed the system operating office controlled the operation of the various pumping stations during the first few days so as to build up a reserve uniformly for all districts.

The graph, Fig. 3, shows the flood stage and the total reservoir storage. The reservoir depletion line shows a fairly uniform trend on Mar. 18 and 19, but on the 20th the depletion was diminished by pumpage of 21 m.g.d. at Brilliant from the filtered water basin. The storage in the filtered water reservoir is not included in the curve nor in any of the storage figures quoted because it was not at sufficient elevation to be available for use. Two of the primary reservoirs were not completely empty at any time; the third, Highland reservoir No. 2, was empty for only two hours, and its district in large part was supplied by a 48-in. and two 24-in. cross connections with the Lanpher reservoir system. All of the secondary reservoirs were empty for periods of several hours to four days, in the case of the Herron Hill reservoir, which is supplied by three secondary pumping stations, Highland, Herron Hill and Saline.

During the complete power outage for 17 hr. and the continued power outage at Saline station for an additional 48 hr., the reservoir was emptied and the Herron Hill and Highland supply alone could not fill the pipelines. Only the higher portions of this pressure zone were out of water for the full length of time that the reservoir was empty. About half the city, including the downtown and other low-lying sections, was not out of water at any time. All sections of the city had a supply for necessary potable and sanitary purposes on Mar. 23, and all restrictions on the use of water were removed on Mar. 29. It was most fortunate that, although several large fires occurred during the early part of the flood period, there was no dangerous conflagration in any district when water was not available.

Emergency service

The delivery of water to institutions and hilltop communities that were out of water was taken care of by the Red Cross and the city bureau of highways. In carrying out this work fifteen city flusher trucks with a capacity of 1,200 gal. each, were sterilized at local dairy plants and used together with fifteen 1,200 gal. milk trucks, eight tank trucks of 400 to 600 gal. capacity each, furnished by the state, and 22 1,260 gal. Atlantic Refining Co. trucks from Philadelphia, which arrived Saturday night, Mar. 21. Tank trucks sent from distant points arrived full from outside sources. Refills were obtained from the Pittsburgh supply and from adjacent water companies at established points where facilities for filling trucks were maintained.

Thirteen institutions in the city and surrounding territory were supplied with a total of 60,000 gal. In addition, about 200,000 gal. were delivered to the communities in high areas where the municipal supply had failed. Tank trucks delivered the water to high districts where the water was dispensed to householders in maximum amounts of 10 gal. to each person or family.

The problem of water supply in the

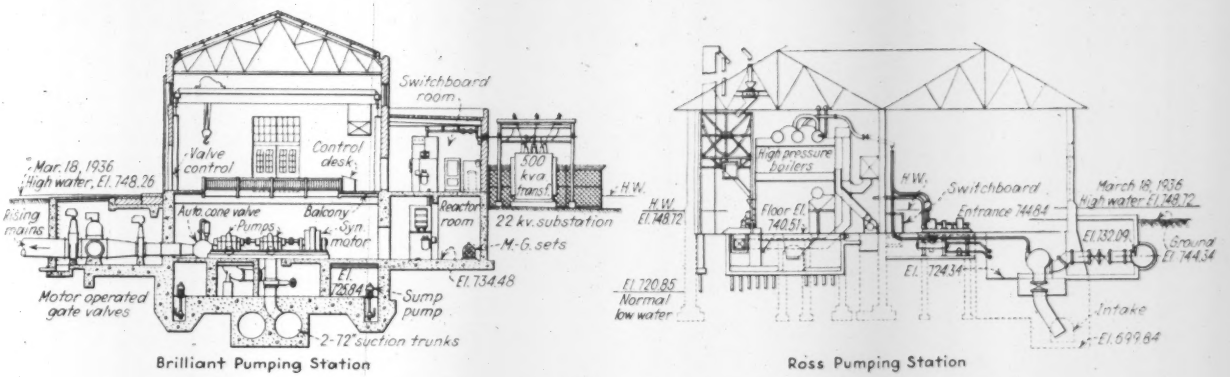


FIG. 4—TWO MAIN PUMPING PLANTS that suffered submergence during the March floods in Pittsburgh.

Pittsburgh district during the flood covers far more ground than the Pittsburgh municipal waterworks. The surrounding communities outside of city limits, and 90,000 people inside the city, supplied by private water companies or separate municipal plants, all had various experiences, some of which were more serious than those of Pittsburgh. Most of the 22 Atlantic Refining Co. trucks were used to relieve water famines in surrounding municipalities. The local office of the Red Cross estimates that 465,000 gal. of water were dispensed with these trucks. Of this amount about 28,000 gal. were delivered within Pittsburgh and the balance to other nearby stricken communities.

Lessons learned

The lessons of the flood are largely those of extention of flood protective measures to meet the standard shown to be necessary by the new flood record. The importance of carrying distribution reservoir water levels high during periods of high water was amply demonstrated, and the extension of storage facilities so balanced as to location that they will give all parts of the city an equal protective reserve water supply is recognized as probably the best possible insurance against water famine. The need of additional water storage, particularly for protection of higher areas of the city, has been realized for many years. Lack of finances is the only barrier in the way of this improvement.

The Brilliant pumping station requires only minor changes, such as moving valve control electrical units inside the main building and the provision of sump pumps with alternate power, to make it easily defensible against the newly established high water record. The Ross pumping station requires numerous structural additions to cope successfully with the new flood height. The large number of door openings below the recent flood levels presents a problem of flood gate construction that must be rugged and enduring, yet architecturally acceptable. Walls around ash handling equipment and in unnecessary openings must be raised above the new high water level and, above all, larger and more reliable sump pump capacity must be provided to take care of the inevitable leakage into the station during high flood stages. The floors in parts of the building are of construction inadequate to withstand the upward pressure of high floods. The reinforcement of these floors with the use of tie-down concrete piles appears to be the most economical remedy for this situation.

It is impracticable to raise the pumping equipment because of the limitations imposed by low water in the river. The electric wiring and switchboard were so thoroughly ruined that it is not economical to repair them. A new switchboard of modern cubicle construction is now being fabricated, to be erected above flood level and connected with waterproof wiring. It has also been found to be advisable to modernize the plant by the installation of a third high pressure boiler and a new turbine generator rather than to attempt to repair the old low pressure equipment. Layout for this equipment is not complete but it will be set high enough above the floor to be operated at times of flood if the layout shows it to be possible to get such a setting in the building.

Preliminary studies indicate that the cost of protecting the Aspinwall station from flooding at the new high water level would be prohibitive and that satisfactory results can be obtained by a temporary transfer of the Aspinwall pumping load to the Brilliant Station and distributing to the north side through the existing pipelines across the river.

Organization

The Bureau of Water, which is headed by managing engineer James H. Kennon, aided by the writer as assistant managing engineer, divides the work into three divisions, each headed by a division superintendent as follows: Filtration division, C. F. Drake, in charge of filtration plant operation and all sanitary laboratory work; mechanical division, W. L. Hirsh, in charge of pumping stations and delivery mains from station to reservoir; distribution division, W. C. Donnan in charge of pipeline and reservoir maintenance, operation and construction.

During the flood, lines of normal responsibility were ignored, and all available forces that could be spared temporarily from regular operating duties, and equipment in all divisions, were turned over to help the mechanical division whose property was most seriously threatened. The detailed rehabilitation of pumping stations was divided under the leadership of the men regularly in charge of the equipment to be rehabilitated, master mechanic E. H. Smith, for mechanical and general work, and assistant power engineer S. A. Canariis, for electrical work, all under the general direction of Mr. Hirsh. Mr. Donnan and his principal assistant engineers, M. B. Foley and M. M. Maneese, and Ed. McCready, supervisor of pipelines, with the loyal help of the employees under their direction controlled the rationing of consumers, took care of pipeline breaks and the operation of valves as required to take the water through unaccustomed channels. The writer was in charge of the system operating office during the rehabilitation period.

Wisconsin Had No Deaths From Typhoid Fever in 1935

A NEW LOW typhoid fever record has been achieved in Wisconsin, according to L. F. Warrick, state sanitary engineer, with no deaths traceable to public water supplies. The record of 113 cases in 1935 is compared with a yearly average of 188 cases for the preceding six years; the 0.29 deaths per 100,000 compares with 0.63 for 1934. With construction of sewage treatment plants under way or planned for 1936, 73 per cent of the 1,730,000 population served by sewage systems will be provided with treatment facilities.

Suspended Roof Construction for Hydraulic Model Shelter

By H. T. Long
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RECENT HYDRAULIC model practice at the Waterways Experiment Station, Vicksburg, Miss. has called for the design, construction, and operation of rather large outdoor tidal models. In such a model where water depths are only from ½ to 5 or 6 inches, even a slight breeze may so distort the water surface as to make observations unreliable. Accordingly, temporary wooden shelters have been erected over and around the models. Since there can be no columns or posts in the model, it has been necessary to use simple wooden truss construction for spans up to 50 ft. and, in the case of a longer span, a more unusual type of construction.

The most recently completed tidal model is one embracing the entrance and a portion of Maracaibo Bay, Venezuela, South America. The models required a shelter 160 ft. x 230 ft. in plan with no columns or posts within this area. Consideration of costs of construction of this model showed that not more, and preferably much less, than $10,000 should be expended for the purpose of providing a shelter. Recalling the Travel and Transport Building at the recent Chicago World's Fair, the writer conceived the idea of suspending the roof from cables. It was also recalled that most levee machine and dragline transmission cables, when discarded due to breakage or wear, were still good cables in-so-far as their "stationary service strength" was concerned. Inquiries were made and it was found that a considerable amount of used cable of adequate size was available, at no cost, for use as suspension cables. Design computations showed that a suspended roof type of shelter could be constructed economically by use of a lightly built up roof.

The structure consists essentially of two parallel rows of columns over which the main cables are strung and from which the roof is suspended. Anchorages for these cables are large logs properly buried to form adequate deadmen. In each main cable there is a large turnbuckle for adjustment purposes. On top of each tower is placed an improvised saddle made of a piece of boiler plate to which is welded a split section of 6 in. diameter extra heavy wrought iron pipe. A U-bolt keeper on top of the pipe section prevents the possibility of side slippage of the main cables.

The roof is hung from suspender-cables of predetermined length, attached to the main cables. For length adjustment, a hook and eye turnbuckle is attached to the lower end of each suspender cable.

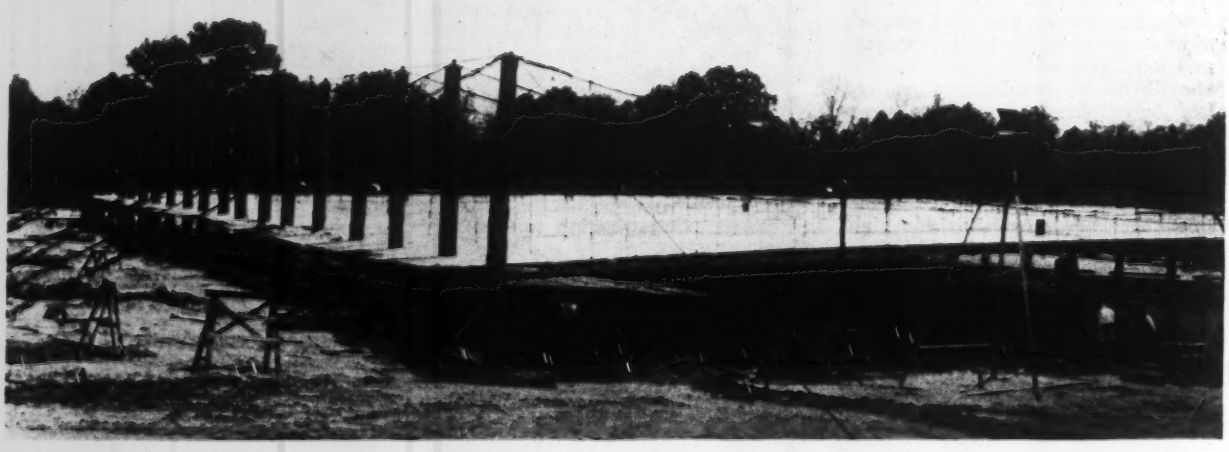
Main roof members to which the suspenders are fastened by short cable loops are 2 x 6-in. timbers lapped at the splices. Joists of 2 x 6's are placed transversely to the main members. For sheathing, 1 x 4's are nailed to the joists on 6 in. centers. This sheathing is covered with 2-ply tar paper.

The sides of the shelter consist of shiplap panels nailed to the cable towers on the sides and to 2 x 6-in. studs on the ends. The top panels of the siding around the whole structure are hinged so that they can be opened when desired. All temporary shelters constructed at the station have been designed with the idea of reusing as much of the material as possible, hence the panel type siding.

The completed structure was designed and erected for about $9,000. It is estimated to have a life, without maintenance other than adjustment of cables due to radical temperature changes (summer and winter), of at least two years. A very severe wind and rain storm was experienced shortly after the completion of the structure. The only damage resulting was the failure of one main cable due to the washing out of its deadman anchorage. The structure has answered the need for a low cost model shelter under conditions which precluded the use of existing types of construction such as built-up trusses.

SUSPENDERS consists of cables and a hook and eye turnbuckle which engages a lashing around the main roof members.

NEARLY AN ACRE of roof suspended from twenty cables resting in saddles on top of the wall posts and anchored to logs buried in the ground.



Transport Trends in China

Ancient methods of transporting goods and persons by manpower still operate in sharp contrast to the motor truck and airplane—Rail lines expanding but the trend is toward a wider use of motor vehicles

By Arthur M. Shaw
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THE AUTHOR has been a close student of transportation in China for several years past, having served as adviser to the National Construction Commission and the Chekiang provincial government from 1929 to 1933, and having kept in close touch with conditions there since his return to this country. In the following article he summarizes the transportation situation as it exists today in China, giving interesting sidelights on the survival of ancient methods of transport, and makes some observations as to what are the present trends in the development of a moderns transportation system for China.

—EDITOR.

IN NO OTHER civilized country have transportation facilities failed so utterly to keep pace with the needs of the people as has been the case with China, though it is doubtful if any other country employs, in its every-day life, as great a variety of transport mediums. In passing through the central part of eastern China, one may see at almost the same time, goods and passengers transported by airplane, railway trains, motor busses and trucks, wheelbarrows, rickshas and canal and river boats, besides a very considerable movement of both freight and passengers carried on men's shoulders. The term *porter* is used in China with its literal, original meaning.

In the northern portions of the country, a wide use is made of animal power, carts being common and pack animals (donkeys, small horses and camels) being employed where the trails are not suitable for wheeled vehicles. The centuries-old caravan routes connecting Peiping (Peking) with Kalgan, Urga and other Mongolian centers are still in use, strings of camels being a frequent sight as they bring in products of the nomadic peoples and coal from the northern mines. From a distance, such caravans are picturesque, but from a closeup, neither the sight nor the odor is particularly appealing.

This article will deal only with that area generally referred to as Inner China, the eighteen provinces lying south of the Great Wall and east of Thibet. With the exception of Manchuria (Manchukuo) and the extension of the Peiping-Suiyan line (which latter will be included in the following discussion), there has been little modern development in transportation facilities in the Outer Provinces.

That the country is sadly in need of more and better facilities has been fully realized by the authorities for many years, and by none more fully than by the "Founder of the Republic," Dr. Sun Yat-Sen, who states in his "San Min Chu I" (The Three Principles of the People) that—"The greatest problem now in China is that of transportation. A great deal of waste results from unsuitable methods. In many parts of China, transportation depends entirely on coolie carriers. The strongest coolie can not carry more than a hundred catties (130 lb.) or travel more than a hundred li (36 mi.) in one day and he has to be paid at least a dollar for this labor. Thus much of China's resources have been used imperceptibly in moving goods."

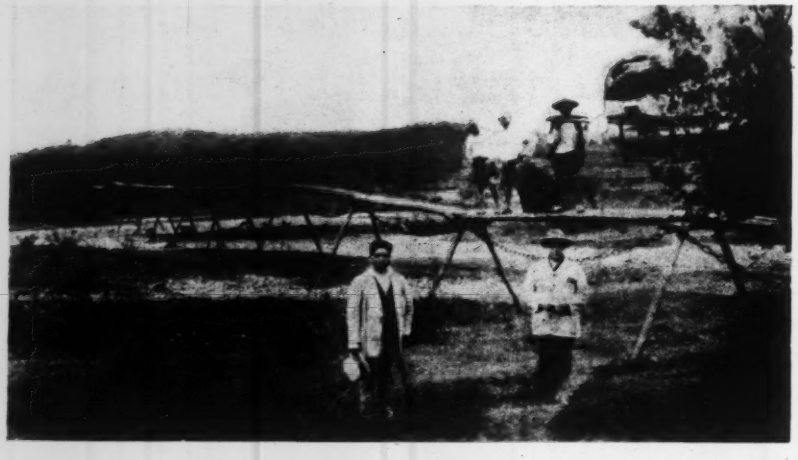
That China now is turning away from this wasteful way of moving her goods is apparent on all sides but it is not yet apparent whether the change will come through a continued increase in railway lines or whether, as in the case of so many countries at the present time, it will come through increased use of motor transport. At the moment motor transport appears to be gaining in favor, but because of highway conditions peculiar to China it may be that further railway expansion will be found necessary.

In the overlapping deltas of the two great rivers of China—the Yellow (which area includes the lesser but very troublesome Hwai River) and Yangtse—there is a complete network of canals and abandoned river beds which afford easy and cheap communication from farm to village and to the larger markets. Before the advent of the railways, the Grand Canal, which parallels the sea coast for about a thousand miles, served for both local and long-distance hauling, but it now has taken a secondary place in the transportation system of the country owing to the construction of railways which parallel it for its entire length and which serve practically the same areas. The longest section now in active competition with the railways for long-distance hauling probably is that from Shanghai to Hangchow, a distance by water of about 170 miles.

The smaller canals of the plains country serve not only as avenues of transportation but they are the main source of domestic water supply for the towns and cities and for the irrigation of rice paddies. Each of the cities and larger towns is interlaced with a myriad of small canals, with some larger ones which are used for navigation of junks of large size.

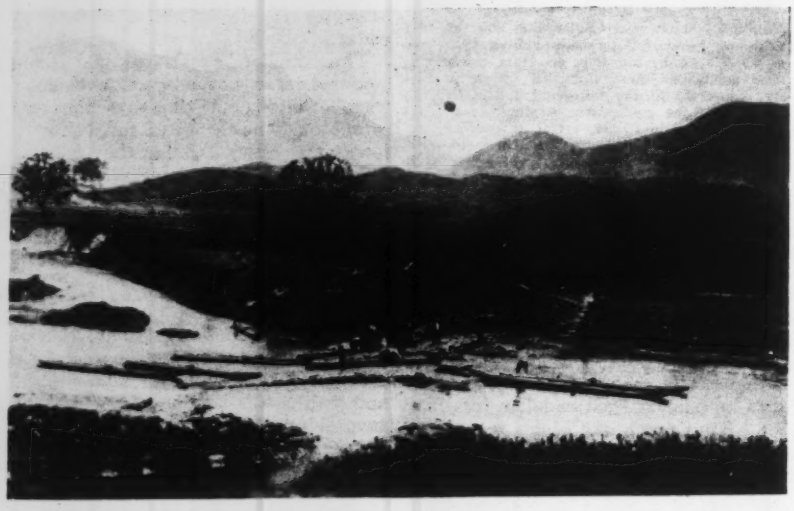
Power boats with tows are used on several sections of the Grand Canal and on some of the shorter routes, but the bulk of the power used in navigating the secondary and smaller canals is wind and man power. When the wind is not favorable, the larger junks are either pulled by men who walk along the tow path with which each canal is provided, or they are propelled by great oars or sweeps of a type peculiar to the Orient. Small sampans are propelled by smaller oars, an ordinary paddle, or a combination of the two. A one-man crew may operate his sampan by using a Western type of oar which he will work with his feet and by a paddle held in his hands. One of my short inspection trips was made in such a boat which carried three passengers a distance of ten miles in only a little more than two hours. The cost for boat hire and motive power was the equivalent of about forty cents of our money.

A few locks were built in the Grand Canal but the most (if not all) of them have been destroyed. Several locks are now planned and some are under construction. The usual method of overcoming differences in level in all of the canals is by means of mud slides. A masonry dam holds the water in each section at its proper level, a smooth way in the masonry being provided near one end of the structure, the faces of which are on a slope of perhaps four to one, or flatter. Well-moistened clay is used as a lubricant in pushing and hauling a boat over this slide. At points where



TRAFFIC JAMS are common on the narrow artificial channels that are used in passing around rapids in the rivers.

SEASONAL BRIDGES as shown in the upper left, are common. Chains attached to the units making up the bridge and anchored to trees on the shore facilitate salvage of the bridge material when the river rises.



MUD SLIDES instead of locks are widely used to get boats from one level to another in the navigable rivers. The view at the left shows boats being taken over such a slide.

TRANSPORTATION COSTS IN CHINA

FREIGHT

Type of Transport	Load Limit, Metric Tons	Travel per Day, Kilometers	Rate per Ton-Km. (Chinese Currency)
Land			
Railways	30	300	$0.010
Auto trucks	1.5	150	0.100
Carts (animal drawn)	1.0	40	0.100
Wheelbarrows	.08	25	0.200
Pack animals (data unsatisfactory)	.08	40	0.300
Human porterage	.04	25	0.450
Water			
Junks, upstream	.....	40	0.022
Junks, in interior canals	.....	...	0.019
Yangtse River—Upper	.....	...	0.116
Yangtse River—Lower	.....	...	0.020
Coasting steamers	.....	...	0.024

PASSENGER

Type of Transport	Travel per Day	Rate per Passenger-Kilometer First Class	Second Class	Third Class
Land				
Railways	700	$.045	$.030	$.015
Auto bus	200	....	....	.020
Rickshaw	60	....	....	.060
Sedan chair	40	....	....	.110
Water				
Junks, upstream	40	.020	.0125	.006
Yangtse River—Lower	300	.070	.050	....
Coasting steamers	400	.060	.035	....
Air				

The rate from Shanghai to Hankow, a distance by air of about 830 km. was (in 1933) $200.

Note that the first class passenger rate given by water includes berth and, except on junks, also includes meals.

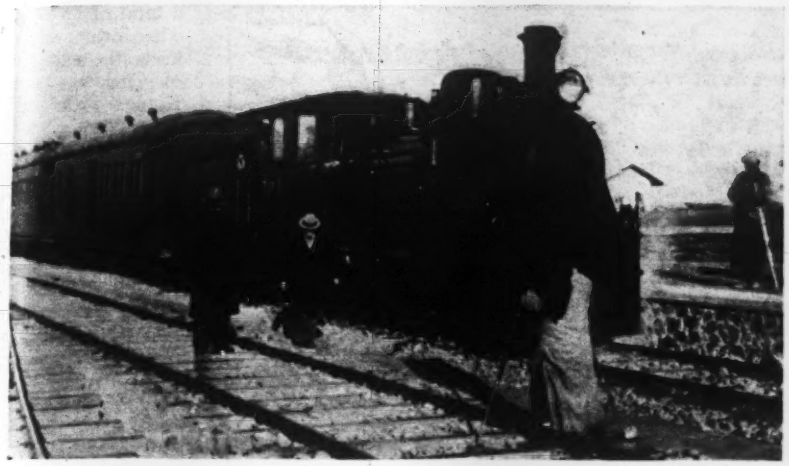
No class distinction is made in land travel, excepting on railways. Based on character of service rendered, other methods are assumed as equivalent to third class on railways.

there is considerable traffic, a windlass is mounted on the dam on each side of the special smooth section.

The most important water route of the interior of China is the lower portion of the Yangtse River, which is navigable throughout the most of the year for ocean-going vessels of moderate draft. As this route is at about 31 deg. latitude, there is no serious difficulty from ice, but on an average of about 26 days of the year low water at several of the crossings prevents the passage of any but the shallower draft steam boats. The lower river section extends from the mouth of the Yangtse to Hankow, a distance of 650 miles. It is used by river packets, a considerable number of ocean-going vessels (usually of not much over 16-ft. draft), and the ever-present junks—in fact, the only part of China where some variation of the old-style junk will not be found is in the mountainous sections.

Difficult river transport

From Hankow to Ichang (80 miles), special boats are required on account of the treacherous channels and many rapids. Excessive power requirements limit the cargo of these boats and necessarily result in comparatively high freight and passenger tariffs. Above Ichang, practically all navigation of the Yangtse is by junk, long lines of "pullers" being required for the upstream trip and skillful handling by sweep and rudder in passing down with the current. Innumerable rocks and eddies



ROLLING STOCK on the Chekiang-Kiangsi Ry. originated in widely separated parts of the world. The locomotive is German, the car underframes are American and the car bodies were built in Chinese railway shops.

spell sure disaster to any boat which is permitted to get out of its proper course. Some of the most dangerous rocks have been removed by blasting but the trip through the gorges of the Yangtse is still attended by many thrills and some danger.

Several of the other rivers of China are navigable for a short distance by small ocean-going craft. River mouths furnish port facilities for such cities as Tientsin, Ningpo, Yungkia (Wenchow), Foochow, Swatow and Canton. The lower reaches of neither the Yellow nor the Hwai can be so used as mud and sand bars have closed these streams to any sort of navigation.

Junks of varying size and draft are used on all of the smaller rivers. Power boats, where used, are mainly for towing purposes though they carry a small amount of local package freight.

Coasting vessels

The coasting trade is handled almost entirely by British, Chinese and Japanese steamship companies and by Chinese sailing junks. The relative tonnage handled by the different nationalities (exclusive of the junks) is in the order stated. (China Year Book, 1935-'36). Vessels flying foreign flags touch only at treaty ports. These include all the larger cities of the coast as well as Hankow, on the Yangtse River. The tonnage handled by ocean-going junks is still considerable, in spite of the sharp competition of both Chinese and foreign power vessels. Foreign seamen have frequently marveled at the skill and daring of the crews of such craft who put out to sea in the face of what appears to the westerner as certain disaster. For generations, these mariners, especially those from Canton, Swatow, Amoy and the Chusan Archipelago, have plied between the coast cities of China, and Philippine and South-Asiatic ports. Trade along the central and northern coast of China is a comparatively recent development that has contributed to the decline of business handled by the Grand Canal.

Highways

During one of the later dynasties, a number of trunk-line roads were constructed, mainly for the use of messengers of the emperor and for the transportation of tribute grain. Few if any of these now exist throughout their entire length, though sections of many of them still form a part of local road systems. In most of the interior sections which I visited, even the better roads were mere footpaths paved with cobblestones or slabs, or with a central slab and cobblestone shoulders. The main thoroughfares from city to city were usually from four to six feet in width, though encroachments by rice fields frequently had so reduced the width that load-carrying coolies had difficulty in passing. On a six-weeks' reconnaissance trip which extended through one province and well over into another, I found only two points where wheeled vehicles were in use. This was as late as 1929. At the boundary between the provinces, two systems of transfer were in use for transporting goods over the dividing mountain range from the head of navigation in one province to that of the other. Wheelbarrows were operated over one route, with long grades estimated to be about 6 per cent and many short sections much steeper. Through another pass, a modern waterbound macadam road had been constructed, to replace an old cart trail, and motor busses and trucks were used for both freight and passengers. The distance by each route was about 25 miles. The two systems maintained active competition until the arrival of the railway a few years later. On this first trip our party traveled 400 miles by sedan chairs and 250 miles by boat.

Pushing a wheelbarrow in long-distance hauling is a most gruelling task. The large-diameter wheel, with its narrow tire, is well designed for overcoming minor inequalities of the road, but the pusher, in order that he may have full control over his load, must carry a considerable part of it on his shoulders. This is effected by means of a strap passing over the shoulders and attached to each handle of the vehicle, hands being used mainly for steadying and guiding. On reaching a bridge approach, or other steep piece of road, ropes are attached to the wheelbarrow and the pushers combine their efforts in passing such obstacles. As a single pusher could not negotiate the more difficult sections, freight hauling is always done in groups of ten or more wheelbarrows. It is not uncommon to see a string of thirty of these passing over a mountain trail. A wheelbarrow in passenger service may solo, but in that case the cargo moves over the steeper portions of the road under its own power.

Carrying coolies travel much faster than those with wheelbarrows, but their day is usually shorter. Under ordinary conditions, the distance covered by each in a day may be considered as about the same. Relative load limits, distances traveled, etc., are given in the accompanying table.

To the uninitiated, travel by sedan chair may seem to be the height of luxury, but if the trip is long, the luxury is more apparent than real. On long trips in fairly easy country, passengers of average weight are carried by two men, with a third man ready for relief. The changes, made without stopping, are at about ten-minute intervals excepting that in the early morning, the men may carry for half an hour without relief. Excepting as they are nearing a definite destination, the carriers set down their load on arriving at each rest house, thus getting a few minutes of complete relaxation about once every hour. Passengers who are considerate of human limitations (including their own) do a considerable amount of walking during the day. On our trips, the baggage porters, each of whom carried a standard load of approximately 60 lb., traveled somewhat more slowly than the chair coolies, arriving at the day's destination about an hour later than the chairs.

The custom, which seems to be exclusively Oriental, of carrying a load by means of a shoulder pole, often strikes a Westerner as illogical, but it has many advantges. The spring of the pole absorbs much of the shock in walking; the most unwieldy objects can be handled conveniently; the load can be shifted from shoulder to shoulder without stopping and it can be set down and taken up readily and easily. The essential equipment is most simple—a pole and a few pieces of string or rope. The method is not suitable however for carrying through timber and undergrowth or where the carrier has to wade through much mud and water.

With the cooperation of the National

Economic Council (sponsored by the League of Nations) and the various provincial governments, great headway has been made in highway construction during the past four years. In 1931, a Three - Province Program was adopted for the rapid construction of roads in Anhwei, Kiangsu and Chekiang provinces. This was extended later to a Seven-Province Program to include the next adjacent provinces. Of the initial program, six trunk lines were completed by October, 1933, with an aggregate length of 650 miles. Many additional trunk lines were completed the following year, as well as about the same mileage of secondary highway construction.

None of the roads constructed so far have been paved, the main portion being surfaced with waterbound macadam, though some asphalt top dressings have been used as binders.

Considerably antedating the work under the Economic Council, the "model province" of Shansi undertook quite an ambitious road-building program, constructing one main road for the entire length of the province, with several cross lines. Also, considerable road building was done by local effort, aided and planned by the China International Famine Relief Commission, in Shensi and Kansu provinces. These roads were built mainly as an emergency relief measure but have contributed substantially to the welfare of the sections reached by them.

Methods of operation of highways run through a wide range, varying, from roads constructed, maintained and operated entirely by private capital for private gain (of which there are a few) to roads for which the initial grading and bridge construction was done by the province and the wearing surface placed, road maintained and motor vehicles operated under concession by private capital; there also are roads completely constructed, maintained and operated by the province. Privately owned automobiles are permitted to run over roads operated under concessions on payment of a reasonable toll.

While the old Manchu Dynasty was

RAILWAY LINES have been built to connect the important cities and are being extended along major travel routes in the inner provinces of China.

reactionary in many respects, it finally became convinced that better transportation in the interior of the country had become necessary. As a result, active support was given to the construction of railways. Prior to the downfall of the dynasty in 1911, about 3,100 mi. of railways had been constructed south of the Great Wall. Included among the lines opened for traffic between 1897 and 1911 are those extending from Peiping to Hankow and from Peiping, via Tientsin, Nanking and Shanghai, to Hangchow. These two lines were respectively 760 and 1,060 mi. in length. The former line is operated as a single unit but the latter is made up of four operating units; all are under the general supervision of the National Ministry of Railways. Until recently, through-car movement beyond Nanking was not possible, but in 1934 a modern car ferry was installed for crossing the Yangtse River and through shipments may now be made from Hangchow to Peiping, or even to Paotow, a total one-way haul of 1,600 mi.

As pacification of the country has proceeded, there has been a renewed interest in railway construction both as a commercial and a military necessity. Within the past few years, a number of enterprises have been carried through, notably (in point of mileage) the Chekiang-Kiangsi Ry. with its 410 mi. of main track, and the Lung Hai Ry., a total of 650 mi. The former connects the capitals of Chekiang and Kiangsi provinces and was constructed entirely within the past five years. It was built entirely with Chinese capital and, with the exception of the writer, who served as consultant, the technical staff was all Chinese. The Lung Hai line was constructed by easier stages as funds were made available. It is planned that it will eventually be extended to Lanchow, the capital of Kansu Province. An extension of the Chekiang-Kiangsi line which is now under construction will afford a connection with the Hankow-Canton line, via Pingsiang.

The last edition of the China Yearbook gives the total of the national railway lines (main lines and branches but not sidings) as 4,500 mi., but this is as of the close of 1932. With the addition of lines constructed and acquired since 1932, it is estimated that the national system now totals not less than 5,500 miles.

As might be expected, with lines built mainly in the alluvial plains, grades generally are easy, tunnels few and alinement free from excessive curvature. On the Peiping-Hankow line however there is one long grade of 1½ per cent with a tunnel at the summit. Freight trains double over this summit in each direction. On none of the earlier railways was any compensation of grade made on account of curvature, but on the newer lines this has been provided.

With the exception of the Hankow-Canton line now under construction, the Peiping-Suiyan line is the only one of the system which runs for any considerable distance through a strictly mountainous section. Only a short distance from Peiping the latter line starts its climb over the summit at Nankow Pass, following closely the old caravan route through Kalgan. The Great Wall of China follows the summit ridge but the railway passes under it through a tunnel 3,580 ft. in length. The operating section known as Nankow Pass, 18 mi. in length, comprises 15 mi. in which there are 50 curves of a total length of 6 mi., many of the curves being 9½ deg., with no compensation of grade

for curvature. The ruling grade in each direction is 3.33 per cent, or 176 ft. per mile. Taking into account an ordinary allowance for curve resistance, the effective grade would amount to about 200 ft. per mile.

With such grades and alinement, and rolling stock in a deplorable condition, one is forced to wonder that the line can be operated at all.

Operating difficulties

In 1932, T. King, chief engineer of the Peiping-Suiyan line stated: "Formerly the passenger and freight cars were all equipped with air brakes. As a result of repeated civil wars during the past ten years, most of the cars have been taken away by military authorities to other lines. The few cars that are left behind have lost the parts necessary in the use of air brakes, and the railway, now being in a bad financial condition is quite unable to replace all of them."

In spite of the many handicaps under which the railways of China are operating, one may travel economically, safely and in comfort (though not always in luxury) on any of the principal lines of the country. Much of the rolling stock is in obvious need of replacement or extensive repairs, many of the bridges have deteriorated to such a point that either a reduction in loading or speed is necessary, and renewal of track ties has not kept pace with decay, but with the moderate speeds at which trains are operated and a generally wise distribution of the limited funds available for upkeep, conditions are rapidly improving in many important directions. Probably the most urgent major expenditure which the railways now face is the replacement of many of the weak bridges. Taking into account the meager funds available, the relatively excellent condition of the roadway is especially noteworthy. The results achieved would be a credit to the maintenance department of any railway.

It should not be inferred from the foregoing that the railways of China always have been, or always will be, unprofitable investments. In fact, one writer who is well acquainted with conditions has stated that: "given interior tranquility and freedom from outside aggression, you can throw down a railway anywhere in China and it will show a net profit from the start." This is perhaps an overstatement, but history indicates that it is not far from the truth. The Peiping-Hankow line was planned as a long-time investment. It did not follow established lines of commerce and even the promoters did not claim that it would become profitable for a number of years. Yet it returned gratifying profits almost from the start and continued to do so until repeated raids by opposing armies destroyed much of its property and the most of its business.

With the exception of perhaps 250 miles of lines, which do not form a part of any through system, all of the National Railways of China are of standard gage (4 ft. 8½ in.). Consideration was given a few years ago to the construction of cheap, narrow-gage lines as a measure of economy and to meet the immediate necessities, but an analysis of the situation showed that railways of a similar standard, but of standard gage, could be constructed at very nearly the same cost and the idea of narrow gage was wisely abandoned. Some of the newer lines have been built with rails as light as 35 lb. per yard, but track structures and other facilities are suitable for heavy service. Demands have so increased on the Hangchow-Kiangshan (now the Chekiang-Kiangsi) line that replacement of much of its 35-lb. rail already has become necessary.

Distribution of railways

From the accompanying map, it will be noted that the provinces of Hopei, Honan, and Shantung are better supplied with railways than are the others, that there are four provinces with no railways and three others which have no rail connection with the rest of the country. Each section of the interior is of necessity practically self-supporting, usually growing only the crops which can be consumed locally, denuding the almost-extinct forests for necessary fuel and perhaps producing a surplus of certain commodities for which no market can be reached. China has many rich coal deposits, fairly well distributed geographically, but the use of coal as a domestic fuel is unknown excepting in the immediate vicinity of the coal fields and adjacent to existing transportation lines. Grass, straw and twigs (there are no weeds in agricultural China) constitute the sole fuel supply of millions of the inhabitants. An improved method for the interchange of commodities will greatly improve the economic condition of the farmers, who constitute 76 per cent of the total population.

Future developments

In a study of the economic possibilities of light railways which I made in 1932 (Economics of Light Railways for China, *Chinese Economic Journal,* May and June issues, 1932) an effort was made to determine the relative cost and the advantages and limitations of the various methods of transportation in common use in China. The result of the study made is summarized in the accompanying table which was planned, as nearly as possible, to represent average conditions though the rates shown for handling bulk shipments by rail and water apply to those commodities which normally take a low classification but which can be handled at a profit at the rates given. Freight classifications for rail haul follow closely American practice. Values are given in Chinese dollars which, at the present rate of exchange, are equivalent to about 33 cents of our money. Weights are in metric tons (2,205 lb.) and distances in kilometers.

According to the latest reports available, air routes are now in operation from Shanghai to Hankow, via Nanking; Shanghai to Peiping; Shanghai to Canton; and from Hankow to Chengtu. Experimental flights have been made for a line from Peiping to Lanchow (in the Northwest) and it is possible that such a line is now in regular operation.

It is estimated that the rates now in operation over the various railway, steamship and air lines are such that a reasonable return may be secured for capital invested and permit the payment of wages that will enable the employes to live better than the average laborer. Junk owners and operators doubtless earn only a meager return while coolie carriers and wheelbarrow men make only the barest subsistence wage. Haulage by motor vehicles has not yet been carried on for a sufficient length of time to make possible any very satisfactory deductions as to cost of operation and returns which may be expected.

If normal conditions are maintained in China, there is certain to be a rapid increase in transportation facilities, especially of improved highways and of railways. In many sections, there has been a transition directly from human porterage to mechanical transport, without the intervening stage found in most countries of hauling by the power of beasts.

Revenue-producing highways

While it is generally agreed that the building of highways and railways will result in the abolition of transport by human power, there is not a general agreement regarding the economics of rail versus highway haul. The present tendency appears to be toward relatively long hauls by truck, or truck and trailers. Within reasonable limits, this method undoubtedly should be favored as highways can be extended to new areas much faster than is possible for railways. It is already appreciated however than road-maintenance costs under heavy traffic will go far in offsetting the heavier initial cost of a railway. Under the Chinese system of highway administration, the modern roads are quite generally operated as revenue-producing facilities. This is true whether operated directly by the government or the province, or leased to private concerns. At least in theory, capital cost and cost of upkeep of the roads are just as important items in the cost of motor haul as are those of gasoline, wages of operators, maintenance of equipment, etc. It is natural that as a result of their method of accounting, the Chinese are coming to a realization of the true cost of transportation over highways at an earlier date than is common in countries where those who use the highways have no direct cause for worry over the cost

of building and maintaining the roads over which their vehicles pass.

It should not be inferred from the foregoing that no highways are built unless a cash return is immediately in sight but that they are placed in much the same category as railways. Though much weight is given to assumed revenues from a proposed road—or railway—the government by no means ignores other features.

With a full knowledge of the importance of both cost of construction and of operation, and of the return in service offered by each, there is being evolved a basis for evaluating the advantages of both railways and highways, with each confined to its proper field. In the meantime, no serious results can ensue from what appears to be the present tendency to concentrate on the construction of highways as these will be needed in any event. There can be no later regrets from overbuilding of highways as would be the case if a surplus of railways were constructed.

Problems in Steel Framing

Building addition to house WGN studios required field milling of columns and driving of nearly a thousand 1⅛-in.-diameter rivets

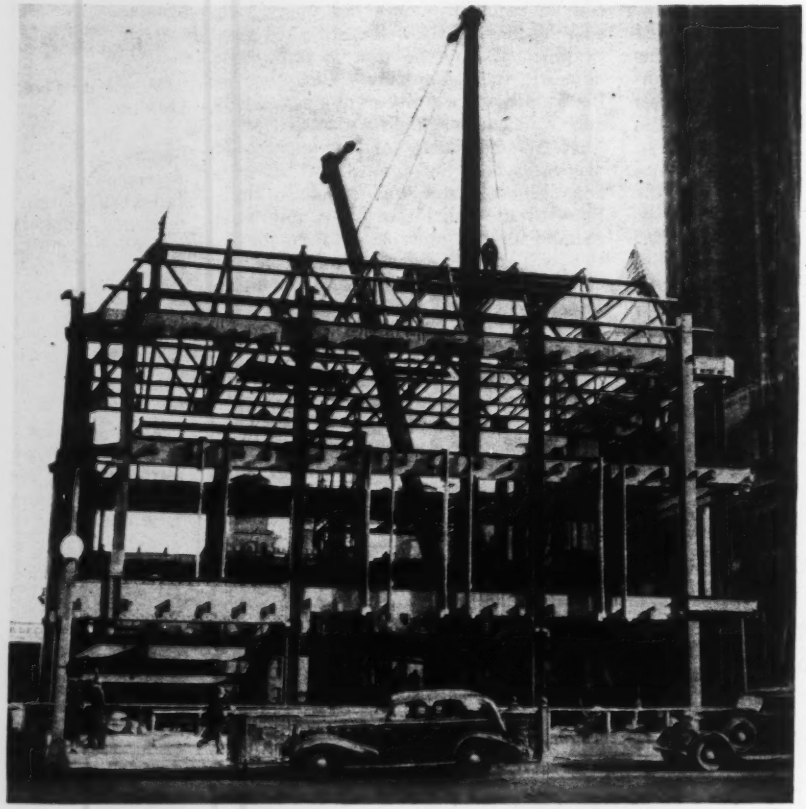
By Albert Smith
Smith & Brown, Engineers, Inc.
Chicago, Ill.

IN DESIGNING and erecting the steelwork for the new WGN studio of the *Chicago Tribune* over the north addition of the Tribune Tower which had been built up to street level in 1926 and housed four long lines of presses in its top or fourth story, a number of special problems had to be solved. Two conditions made these problems interesting. *First*, since the new building was required to harmonize with the stone-walled Tower, there would be great loss if the expensive stone work required were to be taken down when it was desired to complete the building to its full height of 25 stories. Consequently the new 3-story frame had to be designed both for the studio and for the future high building, and future connections planned so as to make removal of masonry unnecessary. *Second*, since the building of the north addition in 1926, the further development of the general plan for the housing of the whole *Tribune* plant and staff suggested changes in the existing column spacing. These changes eliminated the offsets of three columns. The girders which were to have carried the offset columns did no harm except for some clearance difficulties which turning corrected. But the moved columns now had to rest on the top of columns which had not been milled. The columns could not be removed for milling, and rivet splices could not be contrived, so the engineers had to choose between welding and field milling.

One of the columns involved would in the future carry about 1,500,000 lb. Doubtless bearing joints will sometime be welded to that value, but in this case the engineers were unwilling to make so long a forward step, and decided to mill. R. C. Wieboldt & Co., the general contractors, invited the H & K Manufacturing Co. of Chicago to submit a design for a field milling machine. The columns to be milled had structural members on all four sides, so that positive anchorage was possible. Leveling was a delicate task, however, and it was not until the milling process had been carried through twice and the surface checked with a level that it was certain that the failure to get a level surface was due to a "personal equation" of the machine and not to an error in leveling. The second milling on a 116 sq.in. column gave a surface so nearly true that a machinist's level showed no error, and so nearly plane that a .0015 in. gage leaf could not be inserted anywhere between a straight edge and the milled surface. The other columns were considered satisfactory with a level error approximately .02 in. in 14 in.

Changes in column location also made it necessary to carry heavy wall columns on second story girders. Since the clearance requirements were stringent, the connection of girders to columns became a problem. The greatest number of 1⅛-in. rivets that could be utilized was barely adequate at 13,500 lb. per sq.in. Most designers do not like to load such large field rivets to the limit, and ordinary practice would specify tight-fit bolts for these connections. There were about a thousand such holes, and it seemed worth while to avoid the large expense of filling them with bolts if possible.

We first tried the effect of heating the rivets to a light cherry red in a gas furnace. It was thought possible that since the shank so heated would be nearly uniform in temperature through its cross section the rivet could be made to fill the hole. Thirty-six rivets were driven by the riveting crew of Nils Johnson & Co., the erector, at the shop of J. T. Ryerson and Son.



FRAMEWORK of broadcasting studio complete; Tribune Tower at the right.

These rivets had 2⅜, 3½ and 4⅜-in. grips and were driven using 80 lb. pressure. In no case did the rivet fill the hole at the inside of the plate next to the driven head. The rivets with short grips were not notably better in this respect than those with long grips.

A second set of eight rivets with 3-in. grip was driven with rivets heated to a light straw color. The holes were reamed to the smallest diameter that would admit the hot rivets. None of these rivets completely filled the holes, but seven of the eight filled the hole at the critical shearing section.

John F. Keller, of the Engineering Extension Division of Purdue University, suggested to the writer that with a gas heater the half shank next to the head could be heated to a light yellow while the outer half was a light cherry red, and that if that were done the rivet could be made to fill the hole. There was not enough time remaining to test this with specimens, but the engineers felt confident that with such a heating procedure supplemented by the use of a 3 x 1⅛-in. piston riveter with a 9-in. stroke and 100 lb. air pressure, the rivets would fill the holes. These conditions were specified for driving about one thousand rivets at the second floor joints.

Some difficulty was encountered in making the gas heater operate in the open air and it was found necesary to enclose it. Meanwhile a few rivets were driven in one joint which had excess strength and these rivets received their final uniform heating to yellow heat in a coal forge. These rivets were tight, but all had some burr. When the gas heater was perfected, and the rivets were differentially heated, the driven head showed no burr. The rivets were ordered by J. T. Ryerson & Sons, whose formula for rivet lengths gives about ¼ in. more than the A.I.S.C. tables. Inspection and measurement of the driven heads seemed to indicate clearly that more metal had been forced into the holes than where the forge-heated rivets were used.

The incompleteness of the tests leave the engineers without proof that these rivets fill the holes, but they feel confident that all the rivets will cooperate in resisting shear to the greatest degree possible in a connection 45 in. long. There is an opportunity, however, for a research man to render a service to the profession by making a really scientific test on the effect of air pressure, rivet temperature, relative size of rivet and hole and proportions of riveter on the driving of large diameter rivets. Tight fit bolts are very expensive, and it is probable that they are not so effective as a perfect rivet.

Howells & Hood with L. J. Weissenborn, Chicago associate, prepared the plans for the broadcasting studio.

Local Flood Control

New York river regulating district act points to the way in which flood control and river regulation can be directed by local bodies with the cost of the work apportioned among the beneficiaries

By Edwin S. Cullings
Executive Secretary
Black River Regulating District, Watertown, N. Y.

DESTRUCTIVE FLOODS in the Northeastern states during the past few months have centered attention on flood control throughout the country. One of the most troublesome problems is that of financing protective work. While in the past a few projects have been paid for wholly by the federal government under the more or less shadowy guise of navigation improvement, there is a growing tendency to insist on a material degree of participation by the state and local governments, especially in the case of projects not justified by navigation alone.

Another factor of material importance is the maintenance and operation of reservoirs, retarding basins and other improvements after they have been completed. The federal government has at present no permanent organization to which the maintenance and operation of flood-control improvements can be assigned. Here again the need for state or local control and responsibility is apparent.

In the case of the reservoirs recently constructed on the Winooski River in Vermont, the state furnished the lands and rights of way and undertook to maintain and operate the completed structures, while the construction cost was borne by the federal government. It is understood that in the Muskingum River Conservancy District in Ohio, also, the construction cost of an extended system of reservoirs is being paid by the United States, while the state and the district furnish the land and rights-of-way and relocate the highways, railroads and other utilities. The district will maintain and operate the completed system.

If this policy is to become permanent, most states will find it necessary to set up machinery for financing the local share of the cost, for apportioning such cost equitably among the localities benefited and for controlling and operating the completed works. At least two states, Ohio and New York, already have made some progress in solving this problem. The Conservancy Act of Ohio was adopted shortly after the disastrous flood of 1913, and the Miami Conservancy District has been actively in operation since about 1915. In New York, the River Regulating Law, (Article VII of the Conservation Law) somewhat similar to the Ohio Act, was adopted in 1915, and two river regulating districts have been functioning since 1919 and 1922, respectively.

The experience with the river regulating act in New York may afford some suggestions to other states in solving their flood-control problems. The following paragraphs will outline the river regulating act and the experience of the Black River Regulating District.

Stream regulation and water storage have been matters of public concern in New York for a hundred years. The earlier efforts were directed chiefly toward water supplies for the state canals, but during the past half century destructive floods have periodically aroused interest in flood prevention. During the past 25 years, however, emphasis has been placed chiefly on river regulation; that is, the equalization of flow throughout the year by impounding flood waters in storage reservoirs and releasing the stored water into the streams during dry periods. Flood control has been considered largely as incidental to the regulation of flow for the benefit of industrial water power, electric power production, water supply, sewage dilution and other uses of surface water.

Early New York studies

During the decade from 1910 to 1920, the chief emphasis was placed on water power and the needs of industry. In that period a comprehensive investigation of the water power resources of the state was made by the Water Supply Commission and its successor, the Conservation Commission. The reports of these commissions emphasize the highly irregular flow of the New York streams and the need of regulating reservoirs. In these investigations it was contemplated that an extensive system of storage reservoirs, serving all the principal rivers, would be constructed and that the cost would be borne by the municipalities and private properties benefited. It was clearly recognized that a large measure of local control would be necessary for the satisfactory operation of

the regulating reservoirs. Local responsibility was taken for granted.

Prior to 1913 a serious obstacle to reservoir construction in the Adirondack Mountain region was the ownership by the state of a vast area of land, known as the Forest Preserve, which under the constitution must be forever maintained as wild forest land. As most of the reservoir basins on the Adirondack rivers were situated within the Forest Preserve, this restriction prevented the building of reservoirs, even by the state itself. To overcome the difficulty, an amendment to the constitution was adopted in 1913, authorizing the building of river regulating reservoirs within the limits of the Forest Preserve and the use of a limited area of state land for such purpose. With the adoption of this amendment, it was confidently expected that a comprehensive system of reservoirs covering most of the streams of the state, particularly the Adirondack streams, would be constructed and that such improvements would result in the elimination of both floods and periods of very low flow, thus providing for the steady operation of factories, continuous employment, improved sanitation and additional recreation facilities.

Regulating districts authorized

Enabling legislation designed to put this constitutional amendment into effect, as originally introduced in the legislature, divided the state into 20 districts, each comprising the drainage basin of one of the larger streams. This measure contemplated that all the districts should be set up at once. It provided that the affairs of each district should be managed by a local board appointed by the Governor, and that the boards should have authority, not only to build regulating reservoirs, but also to construct river improvements for flood control and other purposes. Before the measure was passed by the legislature, however, the sections providing for flood control and river improvements, other than regulating reservoirs, were eliminated and the section relating to the establishment of the districts was amended to provide that they should be created, one by one, on petition of local parties.

The amended bill was finally adopted in 1915. The first district to be created was the Black River Regulating District, comprising the drainage area of the Black River, which drains the westerly slope of the Adirondack Mountains and flows into the easterly end of Lake Ontario. That was in 1919. The Hudson River Regulating District was created in 1922.

The first work of the Black River Regulating District was the construction of the Stillwater Reservoir on the headwaters of the Beaver River, the second largest tributary of the Black. This reservoir has a capacity of 103,000 acre-ft. and a surface area of 10.5 sq.mi. It was completed in 1925, at a cost of $1,400,000. This reservoir affords reasonably complete control of the flow of the Beaver River, and has eliminated both floods and lack of water on that stream.

The district has also taken over the operation of the Old Forge Reservoir and the Sixth Lake Reservoir on the Moose River, also a tributary of the Black. These two reservoirs were constructed by the state more than half a century ago, in part settlement of damage claims arising from the diversion of water from the Black River for the canal system. Their aggregate capacity is only about 23,000 acre-ft.

The official plan of the district contemplates the construction of at least three more reservoirs on the headwater streams. The largest of these is the so-called Panther Mountain Reservoir on the South Branch of the Moose River, with a capacity of 276,000 acre-ft. Plans have been completed and the project is ready for construction as soon as it can be financed.

In the Hudson River Regulating District the Sacandaga Reservoir, the largest unit in the official plan of that district, was completed in 1930. It has a surface area of about 42 sq.mi. and a total capacity of 868,000 acre-ft. The cost was about $12,000,000.

The Sacandaga Reservoir affords complete regulation of the flow from a drainage area of 1,044 sq.mi., and is of material advantage in reducing the flood stages of the Hudson River as well as in maintaining navigation stages in the lower river during dry periods. During the flood period of the past spring the entire runoff was impounded in the reservoir, with the result that the flood stage at Albany was reduced by about four feet.

How districts are set up

Proceedings for a river regulating district are initiated by petition of interested parties to the State Water Power and Control Commission. After holding a public hearing the commission may issue an order creating a river regulating district, to include within its boundaries the watershed of a single river or an integral part of such watershed. The regulating district board is given authority to make surveys and investigations, to build and operate reservoirs, to issue bonds, and to apportion the cost upon the public corporations and properties benefited. The entire cost is apportioned upon such public corporations and private properties, the state paying no part of the cost, unless the state is the owner of benefited property.

The first work of the river regulating board is the preparation of a general outline plan for the regulation of the flow of the streams of the district, showing the available reservoir sites, their storage capacity, the lands to be taken and certain other information. This plan is subject to the approval of the commission, and when so approved it becomes the official plan of the district. The purpose of the official plan is to show, in general outline only, the feasibility of the proposed system of reservoirs. Engineering details of the various reservoirs are set forth in course of later proceedings.

After the official plan has been completed and adopted, preliminary plans for any of the reservoirs included therein may be submitted to the commission for approval. These plans set forth the major features of dams and other structures, and include outline specifications, estimates of cost, maps of lands to be taken and evidence showing the necessity for the improvement. A public hearing must be held, at which interested persons may appear. The final order of the board may be reviewed in court by writ of certiorari. After the foregoing proceedings have been completed, the board is authorized to construct the reservoir. All construction contracts must be approved by the commission, and the completed work is also subject to such approval.

Apportioning the cost

After the determination to construct a reservoir has been made, the board may apportion the estimated cost upon the public corporations and properties to be benefited. The apportionment is made by the board and must be in proportion to the benefit accruing to the respective corporations and parcels of real estate. Here again, the apportionment is subject to the approval of the commission, and a public hearing must be held. When finally approved, the apportionment is subject to review in the courts in the same manner as an ordinary tax assessment.

The amounts apportioned upon the various municipalities and parcels of real estate are formally assessed upon them by the boards of supervisors of the counties in which they are situated. They may be made payable in one sum or in annual installments over a period of not more than 50 years. Assessments upon parcels of real estate become tax liens thereon.

Financing

Bonds may be issued in the name of the district and the proceeds used to finance the construction of the reservoir. Temporary certificates of indebtedness may be issued to pay the cost of preliminary investigations and other expenses which must necessarily be incurred before an assessment can be made and collected.

After a reservoir has been completed, an estimate of the amount necessary for the maintenance and operation of the reservoir, interest on outstanding indebtedness and the retirement of bonds is made by the board and submitted to the commission. When approved, it is certified to the county boards of super-

visors, to be levied and collected by the public tax collectors along with general taxes.

The regulating district boards are specifically authorized to build and operate reservoirs in the manner above outlined and in addition thereto are granted such other powers ". . . as are necessary and proper to carry into execution the powers expressly granted . . ." The board may acquire real estate, by condemnation if necessary, and it has a dominant right of eminent domain over public utilities and public corporations, except cities. The boards, however, are specifically limited to such " . . . regulation as can be had through the construction, maintenance and operation of regulating reservoirs . . ." No authority is granted to construct flood-control works or river improvements, such as channel straightening and the removal of obstructions. Their authority appears to be limited to the single function of building and operating storage reservoirs for regulating the flow of streams.

Broader power desirable

This grant of authority is sufficient for the work contemplated in the present river regulating act, and, except that more specific provision should be made for the payment of preliminary expenses, the act is not in need of amendment, as long as activities are limited to regulating reservoirs. In most cases, however, adequate control of flood water and the protection of life and property require additional work in the way of river channel improvements, such as dikes, levees, walls, ditches and the removal of bars anl other obstructions. The existing law appears to cover such work only if it can be construed to be an essential part of a regulating reservoir.

Authority to undertake such improvements can be conferred on the regulating districts by comparatively simple amendments to the existing law. The act now provides for the construction, maintenance and operation of regulating reservoirs. It should be amplified and amended in such manner as to specifically provide for such other structures as may be necessary for the control and regulation of streamflow and the protection of life or property.

Another desirable amendment to the law would be a provision for including two or more contiguous watersheds in a single regulating district. In certain cases, more than one of the smaller rivers might be so combined with decided advantages in the way of economy and effective operation. The expense of an operating organization in a small district is likely to be quite burdensome, and a single organization could readily attend to all the work required for two or more such streams.

It should be pointed out that river-channel improvements, such as the removal of obstructions, the straightening and deepening of channels, the construction of dikes, levees and drainage ditches, are now provided for by Article VI of the Conservation Law, an article that has been on the statute books for many years but has not proven effective, and very few improvements have been attempted under its provisions. This article, however, was drastically amended during the recent session of the legislature, in an effort to make it more workable and to provide for cooperation between the state and federal governments in matters of flood protection. In the amended article administrative authority is centered in the Water Power and Control Commission, but with the advice and assistance of a local improvement association. The amended river improvement act appears to be much more workable than the older law but, as yet, there has been no opportunity to demonstrate its effectiveness. It should be especially helpful in local improvements in bringing about an equitable division of the cost between various governmental agencies and the benefited communities and private properties.

Where river regulating districts have been organized, however, all the advantages of the river improvement act might be obtained by enlarging the authority of the regulating districts to include river channel improvements, as above outlined. This could be accomplished without setting up any new governmental agency. With the multiplicity of special districts now authorized by law, such as water, fire, sewer, lighting, drainage, river regulating and river improvement districts, all clothed with limited governmental functions and with the power of levying taxes, earnest consideration should be given to the possibilities of combining the functions of some of these districts and thus simplifying the governmental structure.

It is the belief of the writer, after 15 years of first-hand experience with the operation of the river regulating act of New York State, that this law, with comparatively simple amendments combining the functions of channel improvement with river regulation, promises the most sound and rapid progress toward the full utilization of water resources. The workability of the law has been demonstrated. It provides a high degree of local control by men familiar with the needs and economic resources of the locality. It provides for the review and approval of all projects by state officers, and thus affords opportunity for coordinating the work of the local board with a more comprehensive state or national program. The New York river regulating law places responsibility for initiating, constructing and operating water-control improvements squarely upon the people who receive the benefit. It might well be studied by those in other states who seek to put flood control on a sound basis.

Air Valves on Casings Actuate Primers of Automatic Pumps

EIGHT of the water pumping plants operated by the Los Angeles Department of Water and Power are fully automatic in operation. Of these, five take water from pressure mains, while the other three take water by suction from reservoirs. All are pressure-controlled, except one which is float-switch-controlled.

In the pressure-supplied plants priming before starting is assured by means of air valves on the pump casings. The air valves are either float or electrically-controlled. The electrically-controlled air valves are so wired that they are opened when the motor starting device is energized and closed when the circuits which energize them are broken by flow-detecting devices which operate when flow in the pump-discharge lines begins. The flow-detecting devices may be actuated by motor load, by movement of check-valve spindles or by pressure differential from venturi tubes or pitot tubes. Limitation of the period of flowless operation is had by means of electrically-driven definite-time relays, the time cycles of which are started when the motor starters are energized and stopped when the circuits supplying the relays are broken through the flow-detector—an entirely automatic process.

In plants taking water by suction from reservoirs operation is complicated by the necessity of priming the pumps before starting. In two of the plants of this type the capacity of the pumps is small and in consequence foot valves are provided on the lower ends of the suction pipes. Pump casings are kept under pressure at all times by connecting them to the packing sealing-water systems which are supplied through pressure-reducing valves from the discharge lines. In the other plant, which is of larger capacity, the pumps are primed by means of motor-driven vacuum pumps. The pressure governor first starts the vacuum pump and after the pump casings become filled float switches connected to the casings close and energize the starting circuits of the main motors and open the circuit of the vacuum-pump starter. In all plants duplicate pumps are installed and a manually-operated device is provided so that either one may be the preferred pump. In starting, the pressure governor first starts the preferred pump. If, after the usual starting cycle is completed, the preferred pump fails it is automatically cut out and the spare pump is started.

REGULATING TRANSPORT—III

Railways Seek False Aids

By John S. Worley
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TODAY we find that many of the principal railways are facing serious economic problems. A study of the situation brings up a number of interesting questions, the answers to which would be of great value. It will not be our purpose to answer any of these questions but to point them out and in a few instances to suggest that pursuing a certain course might be beneficial.

Twenty-five years ago there was scarcely a community, village or town which, to all practical purposes, was not wholly dependent upon the railway for the movement of goods and passengers. Also twenty-five years ago once a community had been established upon a railroad, permission to abandon the service, as a rule, was not granted even though the service was unremunerative, the theory being that economic justification of operation should apply to a whole property and not to some small part. Unfortunately, today where the condition of 25 years ago no longer exists, we still have with us the theory that once a railroad is established in the community, the public acquires a vested right to have the service continued regardless of its economic justification or of its absolute necessity to the community.

Hard to reduce mileage

1. Justifiable abandonment of profitless mileage finds objectors even among railways.

Under present laws abandonment can be made only with the consents of the Interstate Commerce Commission and the respective state public utility commissions. These consents are difficult to obtain because of this long established political and economic theory, which, under changed conditions, should not be permitted to control. Also abandonments are generally opposed by the community affected, because of local pride, which sometimes is coupled with the fear that some harm may come even though it is not possible to detect it as of the time. Again government officials, particularly those who hold political offices and frequently senators and representatives in Congress and members of the state legislature, vigorously oppose the abandonment of a railway service even though it is no longer necessary. And finally railway corporations are reluctant to abandon property at large losses unless there is positive evidence such a step should be taken; they also frequently face opposition from security holders who as a rule would share in the loss due to abandonment.

Many of these oppositions might be overcome by granting to the particular railroad a highway freight and passenger franchise by which the rail service would be replaced with highway service.

Power begets exaction

2. Over-regulation and over-exaction by organized labor contribute real difficulties.

It is quite probable that railways are suffering from over regulation due to the fact that for nearly 50 years they have been under the control of the Interstate Commerce Commission and its efficient and vigorous organization, which, during this whole time, has followed a policy of expansion of authority. It is also quite probable that an efficient and energetic organization, such as the commission, which has followed the policy of the expanding of its boundaries, has not confined its regulations to restraint but has gone frequently into activities that were largely of a managerial character. The Interstate Commerce Commission has been almost continuously engaged in research which has resulted in the promulgation of almost innumerable regulatory measures.

An aggressive and long-time study of all existing regulatory measures to determine those that are no longer a public benefit and that are a detriment to the railways would seem desirable at this time. Much good would come from such a study. As far as we know no such study has ever been made and it is certainly one which should receive careful consideration.

Another difficulty faced by railway operation is the result of many years domination of the labor unions. The principle that the laboring man shall be paid a proper wage and work under sanitary and wholesome conditions cannot be denied by any man, but labor unions and their executives are no more free from human frailties than any of our other citizens. Theirs has been the task of protecting the laboring man, which is to be commended; however, in prosecuting this task, which has been done with enthusiasm, they have not been able in some instances to avoid seeking demands and concessions, which were to the detriment of the railways.

In speaking of this subject in all fairness it should be pointed out that there have been many instances where railway executives in their enthusiasm to make an outstanding record in the operation of the properties, have not given proper consideration to the rights of their employees. Out of this conflict between the executive seeking to make an unusual record in the operation of the property and labor union officials seeking to protect their constituents and to obtain special advantage for them, the proper operation of the properties has suffered.

Betrayed by false logic

3. The false aid of legislation against competition has been too much encouraged.

In the period of stress which followed the economic debacle of 1929 and as a result of the above mentioned conditions, it is unfortunate that a number of railway executives conceived the idea that their troubles were external and that they should ask the state to assume the official responsibility of their misfortunes, by giving relief through legislation. Apparently without making a sound analysis of the transportation situation, they assumed their difficulties were largely due to their competitors. Having adopted this assumption, they urged legislation adverse to their competitors. All this had a damaging effect upon the operation of our railways, first, because the cure which is sought will not be effective, and again, because energies, which should have been spent in bringing about an internal cure of the difficulties, have been spent externally.

For a number of years railway executives have industriously and vigorously worked for the intensive regulation of motor vehicles and upon the passage of Senate Bill 1629, known as the Motor Vehicle Regulatory Bill, they expressed themselves as feeling that great benefit would come to the railroads. An intensive study of this bill, over several years, has failed to reveal that it will be of any public benefit. It will be of little or no benefit to the railways.

In the matter of repeal of present regulatory measures affecting railways, attention is called to only one or two

of the many. The annual gross revenue for railway passenger business (1934) was $345,000,000 compared with $1,288,000,000 in 1920. The loss between 1920 and the present time, in general, is not due to other transportation agencies, the motor bus and the airplane, because the gross income of the motor bus in the year 1934 was only $171,000,000, while that of the airplane was only a little more than $8,000,000. The loss in passenger revenue which the railway has sustained has been largely due to the private motor car. It would appear that a very little of this passenger business can be regained.

The gross passenger income of this time being less than twice that of motor bus transportation, it would appear that a continuation of the regulation of passenger rates was no longer necessary and that competition would entirely take care of the matter and take care of it better than it could be done by regulation. If the regulation should be abandoned and the railways permitted to reduce their fares to regain traffic, the reduction should not be permitted to reach a point at which the passenger is carried at a loss.

As has been previously stated, our railways on an average transport 80 per cent of the ton miles of freight moved which makes them by far the most important transportation agency we have and of much more importance than all the others combined. As a matter of fact we could dispense with the service of all others and business would be able to continue although not with the convenience nor as economically as at the present time. On the other hand dispensing with our railways would be the destruction of modern business. Our present economic scheme, including the geographical distribution of society, the kind and distribution of industrial and manufacturing plants, the interdependence of one industry upon others and the interdependence of individuals upon the labor and produce of others, is absolutely dependent upon railway transportation.

The railways having very largely a monopoly in the movement of freight, were they permitted to charge such rates as they might elect, this would furnish opportunities for discrimination between shippers both in the amount of rates and service. Of present freight rates, there is no material complaint either of the amount or of discrimination. In the matter of service the railways are rendering a better freight service today than ever before in their history. The schedule speeds have been greatly increased and the elapsed time between terminals has been greatly reduced. There is a surplus of railway equipment and railway employees are showing every courtesy to the shipper that they may have the shipper's good will and hold his business. In the matter of choice of mode whereby the individual will ship his goods, no such choice exists elsewhere as in railway transportation. From the above it can be seen that any suggestion of entirely doing away with the regulation of the railway freight business is untenable and cannot be recommended. However, intensive studies should be made looking to the repeal of every measure not positively for the public good.

The railways have shown great concern with reference to the small amount of freight hauled by the other transportation agencies and have established many rates to meet this alleged competition. In the regulation of this railway freight transportation, the government should permit the voluntary reduction of rates on any commodity to meet competition; however, this should be restricted to the point that the carriage is not at a loss, and permission should not be given for a blanket increase of rates on all commodities or an increase on those commodities which are of non-competitive nature or are shipped to non-competitive points to make up such losses. This rule should apply likewise to reduction in passenger fares.

Coordination plays false

4. Coordination, pet child of reform, has proved not to be a prodigy.

In June, 1933, Congress passed the railroad emergency act, which was primarily an act of coordination. It created a federal coordinator, whose duties were to carry out the mandates of this act, which mandates, excepting certain recommendations with reference to amendments of the Interstate Commerce Commission Act, were confined solely to the railways.

Congress made large appropriations to meet the expenses of the office of coordinator and by legislative mandate required that the railways should contribute to the expense of the coordinator's organization, in addition to which the railways incurred a large expense on their own account. The coordinator was instructed to take steps of coordination of the railway facilities of the country, with authority to effect changes in physical properties by consolidation or abandonment, complete changes in operating practices, and all other matters pertaining to ownership and operation of the railway properties, which would be in the interest of the properties.

Immediately following the enactment of the bill, the coordinator employed and organized a large government staff and in addition, under the terms of the bill, organized an additional large railway staff to carry out the requirements of the bill. During the two and one-half years in which this bill has been in effect, a number of important studies have been made, which from time to time have been published. Outside of these studies and the preparation of these reports, little or no tangible evidence can be found of coordination in any manner. The reports and studies did make a number of recommendations, which either were opposed by the railways, or were of such a nature it was found not possible for the coordinator to put them into effect or, on further study, the recommendations were found to be impracticable.

As far as the coordination of railway facilities are concerned, we have a parallel in that part of the Transportation Act of 1920 which placed a mandate upon the Interstate Commerce Commission and the railways to bring about a general consolidation of railway properties, which, as everyone knows, has been an absolute failure so far as consolidation goes. At that time, 1920, the transportation act did not disclose much public benefit arising from the proposed consolidations. It seemed quite clear that consolidations to be of a benefit to the public and the carriers, should be of a voluntary character on the part of the railways, planned and made by those thoroughly conversant with the industry and not through a mandate of Congress or a governmental body, the members of which were not qualified to decide such questions. Had Congress followed the principle of regulation, that is, permission to consolidate instead of a mandate that the railroads should be consolidated by a governmental bureau, such consolidation as would have been beneficial to the public and to the railroads would have been accomplished.

Out of the experience of the consolidation act and our present experience of coordination under the emergency railway act of 1933, it should be quite clear that acts where governmental bureaus and officials assume managerial and directional duties in which they are not competent should be sufficient to lead Congress and the government to return to the fundamental basis of regulation, that is, of giving permission for a thing to be done but not assuming directional and managerial control.

The coordinator and his staff made an extensive study of government ownership of the railways, of which the coordinator has been a strong advocate, with a view of obtaining government ownership and operation of railways in this country. For reasons, of which we are not advised, the study and report was a failure in this particular objective, although the coordinator has since frequently repeated that his belief in government ownership and operation of railways had in no way been changed.

Under the instruction to make a recommendation with reference to amendments to the Interstate Commerce Commission Act, the federal coordinator made extensive studies of highway, waterway and other transportation agencies with a particular view of effecting a governmental coordination of these agencies. These studies in many re-

spects have been thoroughly made and have contributed to our knowledge of the operation of the properties. His recommendation of national coordination is a thing which should be given careful study before being accepted either by the Interstate Commerce Commission or Congress. In his enthusiasm for the coordination of transportation agencies, the coordinator made strong recommendations for the reorganization of the Interstate Commerce Commission and the creation of a permanent federal Coordinator of Transportation. This recommendation was strongly opposed by the commission and was rejected by Congress.

As has been pointed out, coordination has different meanings for different people and those who are in favor of it base their approval upon their own particular definition. Commissioner Eastman, in his report, Regulation of Transportation Agencies, Senate Document 152, page 5, says:

"In the final analysis the public interest requires a national transportation system so administered and controlled that services can be furnished at the lowest possible charges consistent with adequate maintenance and the ability to provide the public with modern facilities and the character of service which the best interest of commerce and industry demand."

The whole report of 389 pages is predicated upon the above presumption and, as far as I have been able to find, no inquiry has been made to confirm the hypothesis. Certainly everyone will agree that it is in the public interest to have adequate service furnished at the minimum cost in keeping with the service. This in itself is a truism which need not be debated but that the country needs a national coordinated transportation system is another matter. Again, what control the government should have should be carefully considered. At no time in his numerous reports is Mr. Eastman very specific as to what he means when he speaks of coordination. However, running through the whole fabric of his reports have been the suggestion and implication that he would begin at the top by coordinating various transportation agencies instead of approaching the subject through the coordination of each individual type and each agency in an individual type, improving their financial and operating aspects internally, and later, upon this sound foundation, proceed with the coordination of types so far as this might appear to be positively in the interest of the public and of the transportation agencies themselves.

Mr. Eastman, in all of his reports and recommendations, starts with the assumption that coordination is the thing desired, and at no time has he made any inquiry to ascertain if every coordination would be in the public interest or what particular type might be in the public interest. It is interesting to note that a parallel case of treatment is found at the time of the adoption of the consolidation clause in the Transportation Act of 1920. In that case the consideration paragraphs were predicated upon the theory that consolidation was desirable, no inquiry being made whatever to confirm this hypothesis.

From above it is readily seen that there is no unanimity of views as to what is meant by the term coordination. From the practical viewpoint it will depend in a very large degree upon its actual administration. This, of course, is largely affected by the social, economic and political views of the administrator. Mr. Eastman gives some idea of his views when, in speaking of pipe line companies, he says: "Arrangements for the handling of crude petroleum in carload lots by railroads should be made in the case of all new fields and new construction of pipe lines avoided."

(The following article will consider the regulation of highway transport.)

Laminated Timber Frames Form Stockpile Tunnels

THE VERY LARGE quantity of concrete required in Grand Coulee Dam made it necessary to provide stockpiles of unusual size for storing aggregate materials both at the plant and in the main storage area. All quantity transportation of material on this job is by means of belt conveyors, and more than 2,000 ft. of belt-conveyor tunnel was required under stockpiles. The design of these tunnels was governed by the heavy loading requirement and the desire for economical construction. It was found that solid laminated timber construction had adequate strength and could be put in for about half the cost of reinforced concrete.

FIG. 1 — COMPLETED LAMINATED TUNNEL under the main aggregate storage piles. In the background is the "airplane tripper" in course of erection and, beyond, the conveyor from the aggregate plant.

The height of storage piles ranges up to 70 ft. It was concluded that the full height of material piled over the tunnels might be active to develop pressure upon them. Accordingly, the tunnels were designed for vertical loads of 7,000 lb. per sq.ft. and horizontal loads decreasing from 3,500 lb. at the top of the side walls to 1,750 lb. per sq.ft. at the bottom. To carry these loads in timber it seemed desirable to arch the roof wherever possible and to concentrate the footing reaction near the walls. A haunched section in alternate laminations at the lower corners was used to accomplish this concentration and heavy sills were laid without filling between so as to avoid presenting a solid floor against which upward reaction might be effective.

Tunnels of three sizes were used, as listed in Table I. The widths were determined by the need for access to both sides of the belt. There is adequate headroom in all three sizes. To build on a grade, successive laminations were raised a predetermined amount and thus the tunnel floor uniformly followed the grade so established.

Where openings were required through the roofs for admitting aggregate it was necessary to vary the form of construction. Gates at such openings require a flat roof for nearly the full width of the tunnel for a length of 12 ft.; steel beams were used to carry the vertical load at these special sections. The steel frame was covered with a laminated timber deck and was supported by laminated side walls of 4x12-in. timbers. The floor construction in these gate sections was similar to that used in the arched sections. Under the raw storage pile and in the balancing stockpile at the aggregate plant, where vibrating feeders are used, the feeders were housed in reinforced-concrete structures, as the space required did not

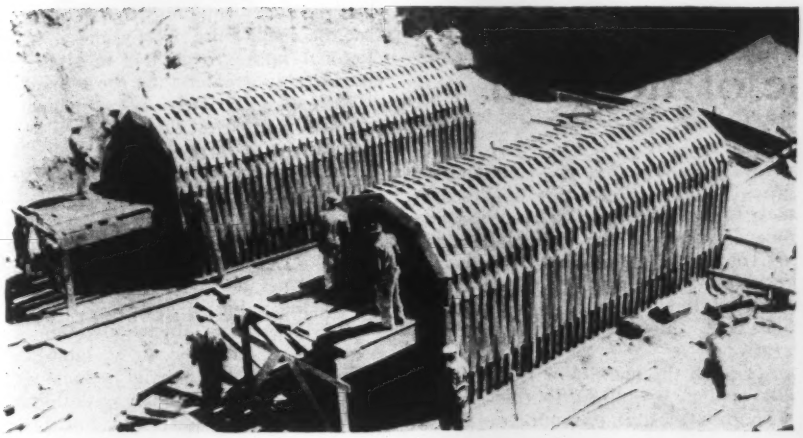
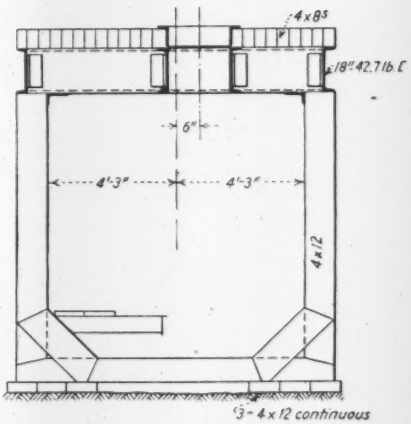


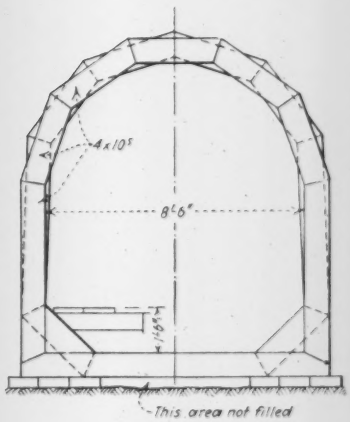
TABLE I—STOCKPILE TUNNELS BUILT FOR GRAND COULEE DAM

Tunnel Width	Belt Width (inches)	Timber Sizes (inches)	Length Built (feet)
7 ft. 6 in.	36	4x8	1350
8 ft. 6 in.	48	4x8	625
10 ft. 0 in.	60	4x10	125
		Total	2100

FIG. 2—ERECTING laminated timber tunnels. The arch is spiked by workmen on the trestle using mauls or pneumatic chipping hammers. Spikes are entered in bored holes before the piece is passed to the erectors.

FIG. 3—TYPICAL CROSS-SECTIONS of the laminated timber tunnels. Gate locations required a flat roof, for which steel beams were used.





lend itself readily to laminated timber construction.

The timber used in the tunnels is No. 2 common Rocky Mountain fir and larch, surfaced hit-and-miss on the two faces. The pieces were cut to exact shape at the mill and at the same time holes were bored for the spikes. A piece-mark was stamped on each piece for identification on delivery to the job. Spikes 7 in. long of No. 1 gage wire were used; the diameter of the bored holes was slightly smaller than that of the spikes and the holes were carefully located to prevent spikes from hitting one another or lining up in such manner as to cause danger of splitting the piece.

Erection was simple and speedy. Spikes were started in all holes before the piece was passed to the men who placed the segments. The spikes were driven with a pneumatic chipping hammer on which a special head had been fitted. Where compressed air was not available mauls were used without much loss in speed of erection. The chipping hammers were rather light for this service, and as a result the spikes were not driven home as effectively as was possible with heavy mauls. This was not a serious objection to the pneumatic hammers because it was possible to place the laminations so that there was no gain at top or bottom as the length of the structure increased.

Erection costs averaged about $3 per lin.ft. of tunnel and lumber costs averaged about $13 per lin.ft. After the crews had been broken in, erection progressed at a very rapid rate; a crew of six men and a foreman could erect about 5 ft. an hour. In one 78-ft. length of the 10-ft. tunnel a crew set out to establish a record with mauls and succeeded in erecting this tunnel complete in 4 hours. This crew consisted of ten men. It is said that it did not turn out work quite as well as would have been expected under less pressure for speed.

In order to ascertain how much the tunnels would yield under load, points were set and measurements were taken soon after the structures were completed. After several months of operation when the two large tunnels were fully loaded for part of their length and a considerable footage of the smaller tunnels was loaded with 50-ft. piles of aggregate, check measurements were made. No appreciable movement nor evidence of distress was found.

The tunnels were designed by the engineering department and erected by the construction department of the Mason-Walsh-Atkinson-Kier Co., general contractors for the Grand Coulee Dam. During this period H. L. Myer was general manager, Francis Donaldson chief engineer, C. D. Riddle job engineer, and Donald O. Nelson structural engineer. M. H. Slocum is general superintendent and E. R. Stokes is superintendent of construction on the aggregate plant.

Paving Brick Changes Recommended by Committee

A PROPOSAL that Simplified Practice Recommendation R1-35 be revised to eliminate two types of brick has been made by the Permanent Committee on the Simplification of Varieties and Sizes of Vitrified Paving Brick. The proposal calls for the elimination of the 2¼ x 4 x 8½-in. plain wire-cut brick (vertical fiber lugless) and of the 3 x 4 x 8½-in. brick of the same type. The action of the committee was based on a survey of brick shipped during 1935. This survey revealed that shipments of the first item, which in 1934 amounted to 9.7 per cent of the total sales continued, during 1935, the rapid decline which began in 1933. The second item dropped from 5.9 per cent to 3.3 per cent. The four recognized varieties remaining in the Simplified Practice Recommendation represent 79.3 per cent of total sales of vitrified paving brick.

Analysis by Moment Distribution Aided Through Use of Iteration

By A. Floris,
Civil Engineer, Los Angeles, Calif.

MULTIPLE-STORY FRAMES subjected to lateral forces can be analyzed in two ways by means of the moment distribution method. In the first, assuming the beams rigid and the columns flexible, the external force at each story may be distributed to the corresponding columns in accordance with their rigidities. Then calculating the moments in this system and distributing them to all members of the frame, the sum of the column moments at each story must be equal to the corresponding story moment of the external force. Any difference between these two values, is redistributed to all members of the frame and the process repeated until a satisfactory agreement between the two values is reached.

In the second method, using the same base-system but assuming arbitrary column moments for each story separately, the moment distribution method is applied. Inasmuch as the moments thus obtained—one set for each story—are proportional to the true moments of the given frame, a system of equations is derived the number of which equals the number of stories.

It will be seen, therefore, that the first method is indirect and tedious and for a frame of several stories almost prohibitive. The second method is direct and easy of application although it involves the solution of simultaneous equations. The difficulties of this obstacle in the second method can be overcome, however, if the method of iteration, or converging approximations of the unknowns, is applied. Such a procedure permits the use of an ordinary slide rule, thus facilitating the work greatly.

Although the method of iteration has been applied by others to the analysis of rigid frames, it has not yet, to the author's knowledge, been used in connection with moment distribution. The method can best be illustrated by means of a numerical example. In the frame illustrated herewith and selected low for convenience, are shown the external forces, the lengths of the members and K, their stiffness factors, i.e., the ratios of their moments of inertia to their lengths. A moment of +1000 kip ft. in clockwise direction is applied in each story in succession at the head and base of the columns, and afterwards distributed to all members of the frame. The three sets of distributed column moments are given in Table I and those of distributed beam moments in Table II (x, y, and z).

For convenience the elastic equations given in Table I are repeated below. Due to symmetry the right hand part of these expressions is equal to half of the respective story moment.

$$+3430.3x - 485.2y + 65.4z = 59.4 \quad \text{I}$$
$$-810.9x + 2459.7y + 571.3z = 26.0 \quad \text{II}$$
$$+109.7x - 552.2y + 2232.6z = 13.0 \quad \text{III}$$

In the above equations it will be noted that the coefficients of x, y and z in the diagonal falling from left to right are considerably greater than the remaining coefficients. In such cases, which is practically all cases, the method of iteration can be applied.

The solution of the above equations is accomplished in the following manner. Assuming $y = z = 1.0$ in I then $x = 0.140$. Using this value and putting $z = 1.0$ in II, it follows $y_1 = 0.289$. Substituting the above values x_1 and y_1 in III the value of $z_1 = 0.0702$ is obtained. Repeating the process for the second time with the x_1, y_1 and z_1 already known, the second values $x_2 = 0.0567$, $y_2 = 0.0456$ and $z_2 = 0.0143$ are calculated. The third and fourth approximations are $x_3 = 0.0240$, $y_3 = 0.0218$, $z_3 = 0.0100$ and $x_4 = 0.0201$, $y_4 = 0.0196$, $z_4 = 0.00965$, respectively. The accuracy of the final values can be tested by direct substitution. The calculations were carried out by means of an ordinary slide rule.

By multiplying the values in the column under *x* of Table I by 0.0201, those under *y* by 0.0196 and those under *z* by 0.00965 the actual values of the column moments are finally obtained by summation. The same is true for the beam moments of Table II not used in Table I. The final values are omitted here as the purpose is only to show the application of iteration to the solution of the problem.

TABLE I—DISTRIBUTED COLUMN MOMENTS PRODUCED BY 1,000 KIP-FT. MOMENT APPLIED IN EACH STORY

	Values of Coefficients of x (1st Story)	y (2nd Story)	z (3rd Story)	Exterior Story Moments Kip Ft.
A_c	+ 877.4	— 103.4	+ 12.2	
C_a	+ 758.9	— 195.0	+ 35.5	$54 \times \frac{22.0}{2}$
B_d	+ 929.1	— 66.4	+ 2.1	
D_b	+ 864.9	— 120.4	+ 15.6	
Eq. I	+3430.3	— 485.2	+ 65.4	+ 59.4
C_e	— 374.7	+ 516.8	— 82.3	
E_c	— 129.0	+ 537.7	— 237.1	$4.0 \times \frac{13.0}{2}$
D_f	— 214.7	+ 698.2	— 78.2	
F_d	— 92.5	+ 707.0	— 173.7	
Eq. II	— 810.9	+2459.7	— 517.3	+ 26.0
F_e	+ 66.2	— 250.7	— 501.4	
G_c	+ 14.4	— 61.6	+ 385.2	$2.0 \times \frac{13.0}{2}$
F_h	+ 20.2	— 173.4	+ 686.4	
H_f	+ 8.9	— 67.1	+ 659.6	
Eq. III	+ 109.7	— 552.2	+2232.6	+ 13.0

Note: A_c is the moment in Column AC at A; C_a is the moment in the same column at C.

THREE-STORY symmetrical frame with typical dimensions, stiffness factors and loads.

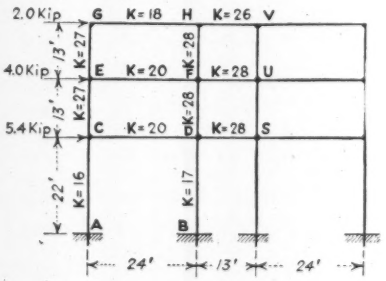


TABLE II—DISTRIBUTED BEAM MOMENTS PRODUCED BY 1,000 KIP-FT. MOMENT APPLIED IN EACH STORY

	x = 0.0201 (1st Story)	y = 0.0195 (2d Story)	z = 0.00965 (3d Story)
C_d	—384.2	—321.8	+ 46.9
D_c	—311.5	—270.9	+ 33.5
D_e	—338.7	—306.9	+ 29.1
E_f	— 62.8	—287.6	—264.3
F_e	+ 40.8	—264.3	—231.6
F_g	+ 31.5	—287.3	—281.1
G_h	— 14.4	+ 61.6	—385.2
H_g	— 6.7	+ 23.4	—313.2
H_e	— 2.2	+ 43.7	—346.4

Note: C_d is the moment in beam CD at joint C

CURRENT NOTES ON SEWAGE DISPOSAL

An analytical summary of recent developments conducted by

WILLEM RUDOLFS
Chief, N. J. Sewage Experiment Station
New Brunswick, N. J.

● SEX-HORMONES IN SEWAGE

The value of sewage for irrigation purposes has been assumed to lie specifically in the quantities of plant nutrients such as nitrogen, potash and phosphoric acid that are furnished to the soil in addition to small quantities of other minerals such as calcium, magnesium, silicon, etc. It has been found that on the basis of available plant nutrients sewage in general produces better growth than other fertilizers.

It now appears that other very important constituents have been overlooked, and Bach, (*Städtereinigung*, 1935, p. 723) in all earnestness, calls attention to the vitamins and hormones present in human and animal excretions.

He discussed particularly the sex-hormones present in urine which, he claims, greatly stimulate the growth of plants and cause fruits to ripen earlier. Sewage contains the sex-hormones of the entire community and in addition to the "manuring value" and the "moisture value" it is said that the "stimulation value" is possibly of greatest importance. The author claims that artificial fertilizer, although rich in mineral constituents, can not compete with domestic sewage, poor in plant nutrients but rich in hormones. Freshly settled sewage solids are considered rich in "stimulation values." Further investigation along these lines may bring forth startling revelations.

● GARBAGE DISPOSAL WITH SEWAGE

During the last two years the possibility of garbage transportation through sewers and its consequent treatment at municipal sewage plants has been widely publicized. Some experiments have also been made relating to the possibility of digesting the mixtures. The fact that certain amounts of garbage have been dumped in sewers for years in localities where waste collection facilities are poor or where, in apartment houses garbage collection is inconvenient, might lead to the conclusion that such a system is feasible. However, a survey of plants receiving considerable daily quantities of garbage may give a lead as to what difficulties may be expected. The recent experimental results obtained at Indianapolis and Urbana (*Sewage Works Journal*, January, 1936) indicate that mixtures can be digested, but that it is absolutely necessary to submerge continually the material that collects at the surface of the tanks. This is the same experience that was found in Milwaukee and Dresden when screenings digestion experiments were made. Attention should also be called to the fact that at Indianapolis the volatile garbage solids were only one-third of the volatile sewage solids. Statistics available show that the garbage solids produced in a community are considerably higher than the proportion added in these experiments.

● INCREASING THE DENSITY OF SETTLED SLUDGE

The large volume of moisture retained in settled sewage solids is one of the important factors in subsequent treatment of the sludge and its disposal. Various thickening devices have been employed in an effort to increase sludge density and thus reduce considerably the amount of water to be pumped in addition to the solid matter. This is of considerable importance where activated sludge, frequently containing less than 2 per cent of solids, must be handled for dewatering, sludge return or digestion. Model plant experiments made by Ardern and Lockett (*Proc., Institute Sewage Purification, 1935, 100*), where quiescent settling was compared with the settling of activated sludge in a circular apparatus provided with a rotating mechanism of the so-called "picket-fence thickener," have shown that activated sludge containing 1.78 per cent solids could be concentrated as much in six hours as normally is achieved by 24 hours quiescent settlement.

● POISON GASES IN SEWERS

The danger of poisonous gases in sewers and in certain units or appurtenances of sewage plants needs to be kept constantly before designers and operators. The extremely toxic nature of hydrogen sulphide gas in sewers and its frequent occurence have been noted on numerous occasions. Bertharion (*Technique Sanitaire Municipal*, No. 30, p. 228, 1935) states that subacute intoxication is possible by exposure of several hours to hydrogen sulphide concentrations of 5 to 20 p.p.m., or in 5 to 10 min. at concentration of 50 to 60 p.p.m. Sewage gases frequently contain from 0.2 to 1 per cent hydrogen sulphide. The irritation first is noted in the eyes and mucous membrane, and in severe cases results in pulmonary edema.

● TRICKLING FILTER MEDIA

Few results are available on the efficiency, durability and general usefulness of different media for trickling filters for the stabilization of sewage, where the same sewage applied at the same rates is used. Under such conditions it has been shown that the gross purification, but also the tendency to clogging, increases with the roughness of the filter media. By operating filters containing unwashed coke, slag and broken sandstone of the same size and receiving the same dosages of sewage for a period of six years, Slater (*The Surveyor*, Mar. 20, 1936) found that the average purification effected on settling tank effluent was 83, 79.7 and 76.2 per cent respectively. The filters discharged a good deal of grit, particularly in the case of broken sandstone, which caused pump troubles due to scouring of the plungers and valves; to overcome this difficulty sand catching basins were placed in front of the humus tanks. In all cases nitrification was very high for American standards, varying from 21.5 to 27.0 ppm of nitrates as nitrogen. The author concludes that the best effluent was produced by coke and the poorest by the broken sandstone, which also unloaded the most solid matter. These results are similar to the experience and findings in American practice. The type of media depends in large measure on local conditions such as its availability, cost, and climatic conditions of the region.

● SLUDGE REAERATION

Opinions vary regarding the value of sludge reaeration in the activated sludge process. Results obtained on plant scale experimentation in this country and abroad are conflicting since in some cases the practice is beneficial and in others good results are not achieved. It is therefore of decided interest to hear from Bottcher (*Gesundheits Ingenieur, Feb. 1, p. 67, 1936*) that in Berlin the practice has proven to be not only unnecessary, but definitely detrimental to good operation. Without reaeration and under greater load the Stahnsdorf plant not only worked better but required less air. Using 0.7 cu. ft. of air per gallon of sewage without reaeration, 27 per cent more nitrates were produced with one-third more sewage handled, as compared with the previous use of 0.84 cu.ft. of air per gallon part of which was consumed for reaeration; return sludge had been reaerated for a period of 6 to 8 hours.

Book Reviews and Notes

A Monthly Commentary on Current Additions to the Civil Engineer's Library

A Biographical Sketch of Watt

JAMES WATT, CRAFTSMAN AND ENGINEER—By H. W. Dickinson. Cloth; 6 x 10 in.; pp. 207; halftones and line drawings. Published by the University Press, Cambridge, England, and the Macmillan Co., New York. Price $4.00.

IN THIS WORK H. W. Dickinson gives us another of the all-too-rare biographical sketches of the earlier pioneers in engineering. James Watt is best known for his development of the steam engine, but civil engineers will be interested to learn that he spent about five years in survey work and in making reports on canals, harbors, etc. Being of an inventive mind and having only crude instruments to work with, Watt spent no little time in perfecting the instruments with which he worked. He liked the survey work and the preparation of estimates, but he disliked executive work and handling accounts. As a result, after a few years trial, he gave up the civil engineering and devoted himself to subjects more to his liking.

Structures in Sea Water

DETERIORATION OF STRUCTURES IN SEA WATER—Edited by S. M. Dixon and H. J. Grose, for the Department of Scientific and Industrial Research. Fifteenth report of the Committee of the Institution of Civil Engineers. Cloth; 6x10 in.; pp. 138; photographs, diagrams, tables. Published by His Majesty's Stationer Office, London. Price 12s.6d. Obtainable in this country through British Library of Information, 270 Madison Ave., New York, for about $3.40.

FOR TWO DECADES a committee of the Institution of Civil Engineers has been making a study of the deterioration of structures of timber, metal and concrete exposed to the action of sea-water. During that period it has submitted fourteen interim reports. This report is a summary of the experimental work done to date together with a statement of conclusions that have been drawn from the results obtained so far. Originally the study was financed by the British Department of Scientific and Industrial Research, under which department the present work has been published, but in recent years many other public bodies have contributed to the support of the work. The report is divided into four main parts, timber, steel and iron, protection by means of paints, and concrete. Each section is conveniently arranged for quick review, an outline of the work undertaken being given at the opening with conclusions immediately following. The remainder of the section gives details of the experiments for those who wish to make a fulerl study. No brief summary of the conclusions is possible, but it is of interest to note that in the section on concrete the conclusions add new emphasis to the need for impermeability in concrete that is to go into structures exposed to sea water. No one of the many cements studied showed any special advantage that would make up for the lack of impermeability.

The tests are being conducted at widely scattered points in the British Empire in order to observe the effects of different climatic conditions and water temperatures.

Old Water Pipes

CAST IRON PIPE: ITS LIFE AND SERVICE—The Stanton Ironworks Co., Ltd. Cloth; 5x8 in.; pp. 118; photographs and tables. Price not given.

MORE THAN SIX CENTURIES AGO avoidance of waste was considered important in waterworks service, according to ancient records assembled by A. Moynihan, waterworks engineer of the Dublin Corp. It appears that a year after the earliest supply of that city was established (1254) a monastery was permitted to make a connection to the conduit provided the pipe inside the house be no larger than a man's little finger. Later connections, probably to smaller establishments, were limited to the size of a goose quill. The material of these early pipes is not known, but two centuries later lead pipe is spoken of. After still another 300 years came the first cast iron pipes, the tenderers for which included Abraham Darby of Coalbrook, originator of coke smelting of iron. The Stanton Iron Works Co. of Nottingham, England, gives these historical notes with many others in this interesting book of anonymous authorship. The essence of the work consists of life records of cast iron pipe in England, collected from waterworks and gas engineers. A 1½ in. pipe at Stow-on-the-Wold that has been in service for 150 years is included in the records. With some supplementary data from the continent and the United States, the latter including the historical records compiled in recent years by the Cast Iron Pipe Research Association, these reports make the book an instructive addition to literature on materials. Data on the nature of the soil in which the old pipes were embedded are in the main lacking, but the number of cases of excellent preservation reported suggests that long life was obtained in a variety of soils.

Epidemiology

Reviewed by M. N. Baker
Upper Montclair, N. J.

EPIDEMICS AND CROWD-DISEASES—An Introduction to the Study of Epidemiology. By Major Greenwood. Cloth; 5x9 in.; pp. 409; linecuts and tables. Published by Williams & Norgate, Ltd., London; The Macmillan Co., New York. Price $5.50.

HIPPOCRATES in his "Airs, Waters and Places" and his "Epidemics" outlined some of the fundamentals of the study of epidemics. After his death in 377 B.C. the subject was ignored for five hundred years, says Prof. Greenwood in his "Epidemics and Crowd-Diseases." Galen then discussed the subject, but only to obscure it in false assumptions. Then for centuries epidemiology was again ignored or when discussed veiled in the obscurities of Galen.

As has occurred in many of the great advances in public health, it was not a medical man who put epidemiology on its feet. This was done by John Graunt in a little volume published in 1662, a discriminating study of the London Bills of Mortality, established in 1532. Graunt's work received little attention from medical men.

A new era in vital statistics, affording a basis for epidemiological investigations, began with the appointment in 1839 of a young medical man, William Farr, as "compiler of abstracts" of the data reported to the General Register Office.

Attention to the cause of the spread of some diseases was given by Farr in his second report, but merely in a foot note. He said that "the hypothesis that the causes of epidemics are generations of minute insects transmitted from one individual to another has been ingeniously put by Dr. Holland in his *Medical Notes and Reflections.* Henle, of Berlin, has supported the theory by new facts and analyses." This was far from new. Three hundred years earlier (1546) a Veronese physician, H. Fracastori, had published a book and "secured immortality by coining the word *syphilis,*" says Prof. Greenwood. Continuing: "Fracastori was the first man to make it seem probable that *living* contagion capable of propagation might be concerned in the transmission of disease."

Prof. Greenwood does not state that 1,600 years earlier the Roman husbandman and author, Varro in his "Rerum Rusticarum" (37 B.C.) wrote that in choosing a site for a farmstead "swampy places" should be avoided "because as they dry, swamps breed certain animalculae which cannot be seen with the eyes and which we breathe through the

nose and mouth into the body where they cause grave maladies."

Having noted a few high spots in Prof. Greenwood's book its plan and scope may be outlined. Part I, General Principles and Methods, first takes up Hippocrates and Galen. It then passes over the Dark Ages to the Revival of Learning, then to Graunt and later writers. Chapters on the Age of Pasteur and Galton, Experimental Epidemiology, and Artificial Immunization are followed by discussions of nutritional, occupational and psychological factors. Part II, Special Illustrations, reviews the whole range of communcable diseases, including typhoid, cholera and influenza. Under typhoid a few classic outbreaks are outlined and correlated with the science of epidemiology.

The book is not technical, either in a medical or statistical sense. It is based on lectures at the London School of Hygiene and Trophical Medicine. It should be useful to public health students and administrators, to sanitary engineers and to the growing number of people who take an intelligent interest in the control of epidemic and crowd diseases.

Miscellaneous Notes on Booklets and Reprints

OPERATING COST of light duty trucks is the subject of a pamphlet published in mimeographed form by the Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City.

A REVIEW OF RAILWAYS OPERATIONS IN 1935 is the subject of special series No. 64, Bureau of Railway Economics, Association of American Railroads, Washington, D. C. This is an annual publication of the association.

ALL THE BRIDGES OF URUGUAY, totaling some 200 built, 8 under construction and 52 proposed, are described in a 50-page booklet published by the Ministry of Public Works, Republic of Uruguay, Montevideo. Its author is Ponciano F. Torrado.

EARLY HISTORY OF RAILROADS in Connecticut is given in a pamphlet entitled "The First Twenty Years of Railroads in Connecticut," published by the Tercentary Commission of the state of Connecticut. Copies may be obtained from Yale University Press, New Haven, Conn. Price, 25 cents.

FATIGUE TEST OF WELDED CONNECTIONS, a paper by Dr. Ing. Kommerell, director of the German State Railways, before the International Association for Bridge and Structural Engineering, has been translated and published by the American Institute of Steel Construction, 200 Madison Ave., New York City. The paper furnished parts of the data used by the American Welding Society committee in developing its bridge welding specifications.

PURIFICATION OF CREAMERY WASTES by trickling filters with particular reference to the effect of types of filling material and dosing cycle is described in Bulletin 124 of the Iowa Engineering Experiment Station, Ames, Iowa.

TESTS FOR TRAFFIC DURABILITY of Bituminous Pavement is the subject of Bulletin No. 9, National Crushed Stone Association, 1735—14th St., N.W., Washington, D. C. The paper is by A. T. Goldbeck, engineering director of the association.

HOUSING FOR THE FAMILY is the subject of a pamphlet published by the Woman's City Club of New York, 22 Park Ave., New York City, price 25 cents. The pamphlet is a study of housing essentials compiled from interviews with New York housewives.

A PAPER entitled "Variation of Wind Pressure Distribution on Sharp Edged Bodies," by C. Nokkentved has been published by the Structural Research Laboratory, Royal Technical College, Copenhagen. The paper is printed in English.

NATIONAL AND STATE PLANNING articles and papers published in the United States since 1928 are listed in a booklet published by the National Resources Committee, Washington, D. C., under the title "Some Recent References on National and State Planning" in the United States.

OPERATIONS OF THE HIGHWAY RESEARCH BOARD are briefly reviewed in a pamphlet entitled "Organization, Aims and Activities of the Highway Research Board," published by the Division of Engineering and Industrial Research, National Research Council, Washington, D. C.

INCOME AND ECONOMIC PROGRESS is the title of Public Affairs Pamphlet No. 1 published by the Public Affairs Committee, National Press Bldg., Washington, D. C., under the auspices of the Maurice and Laura Falk Foundation. Price 10 cents. The pamphlet is based on the 4-volume study by the Brookings Institution.

RESEARCHES RELATING TO WIND FORCES on structures are briefly reviewed and discussed in a recent Austrian booklet entitled "Berechnung der Tragkonstruktion von Hochbauten fur Windkrafte." Published by Ostereichischer Bundesverlag fur Unterricht, Wissenschaft und Kunst, Wien, Austria. The book is largely theoretical.

DEVELOPMENT WORK by the Port of New York Authority is reviewed in a monograph, published under the title "The Port of New York Authority." In addition to the port development work and the financial operations of the authority, the bridges and tunnels built and operated by the Authority are briefly described. Copies may be obtained from the Port Authority, 111 Eighth Ave., New York City.

THE UNIFORM MECHANICS LIEN LAW of Florida is analyzed by Myron H. Lewis, consulting engineer, in a booklet published by the Rugere Press, 55 West 42nd St., New York. Price $2. Florida is the first state to adopt the uniform mechanics lien law that has been under study for the past ten years.

ABSTRACTS OF EARTHQUAKE REPORTS covering the third quarter of 1935, for the Pacific coast and the western mountain region, recently were issued by the Coast and Geodetic Survey in mimeograph form. The set gives a typical picture of the frequency of slight shocks in that region. Intensities at different points and locations of epicenters are given.

THE REPORT TO CONGRESS of the Tennessee Valley Authority on the unified development of the Tennessee River system has been published by the Tennessee Valley Authority, Knoxville, Tenn., in pamphlet form. The report is illustrated with halftones, line drawings and colored maps showing the project under construction or recommended for constructions.

GOVERNMENT OWNERSHIP OF RAILROADS is the subject of two pamphlets published by the Transportation Association of America, Transportation Building, Chicago, Ill. One is entitled "Some of the Causes of Government Ownership Abroad," and the other is entitled "How Government Ownership Came About in Canada." The latter relates to the Canadian National Railway System. Copies may be obtained from the association office.

New Books and Revised Editions

[*Those desiring copies of the books listed below or mentioned elsewhere in this section should order them from the publishers or from their local booksellers.*]

ANNUARIO DOS SERVICOS HIDRAULICOS: 1934—Prepared by the Bureau of Public Works and Communications. Paper; 6x10 in.; pp. 368; photographs, diagrams and tables. Published by Direccao Geral dos Servicos Hidraulicos e Electricos, Lisbon, Portugal.

COLORADO RIVER AQUEDUCT—By F. E. Weymouth. Second edition. Paper; 8½x11 in.; pp. 65. Published by Metropolitan Water District of Southern California, Los Angeles, Cal.

CONSTRUCTION COSTS—"The Construction Industry Year Book"—9th edition. Paper; 9x12 in.; pp. 128; charts and tables. Published by Engineering News-Record, 330 W. 42nd Street, New York. Price $1.00.

CONSTRUCTION MATERIALS INDEX—Compiled by E. L. Norberg. Paper; 8x11

in.; pp. 204. Published by Construction Materials Research Co., San Francisco, Cal. Price $10.00.

COST OF GOVERNMENT IN THE UNITED STATES: 1933-1935—The National Industrial Conference Board Study No. 223. Paper; 6x9; pp. 98; charts and tables. Published by National Industrial Conference Board, 247 Park Ave., New York, N. Y. Price $2.00.

THE DESIGN OF REINFORCED CONCRETE STRUCTURES—By Dean Peabody, Jr. Cloth; 6x9 in.; pp. 457; tables and charts. Published by John Wiley & Sons, Inc., New York, and Chapman & Hall, Ltd., London. Price $4.00.

ELEMENTARY PLANE SURVEYING—Text and Manual. By Raymond E. Davis. Fabricoid; 5x8 in.; pp. 424; halftones, linecuts and tables. Published by McGraw-Hill Book Co., New York and London. Price $3.00.

ENGINEERING VALUATION—By Anson Marston and Thomas R. Agg. Cloth; 6x9 in.; pp. 655; charts and tables. Published by McGraw-Hill Book Company, New York and London. Price $6.00.

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Letters to the Editor

Concrete Beam Design

Sir—An error occurred in assembling the material for my article entitled "Taking Account of Axial Compression in Concrete Beam Design," published in the issue of April 30, p. 632. The left hand side of equation (7), equation (8) and equation (9) should be multiplied by E_c instead of divided by E_s. The right hand part of equation (9) is correct as shown and nothing elsewhere is affected by this oversight. These equations are vital to the development of a new principle in the mechanics of materials, and I hope you can find room to print this correction for the benefit of those who wish to prove this principle.

HARRY E. ECKLES

Springfield, Ill.
June 15, 1936.

Assistant Highway Engineer, Illinois Division of Highways.

Resisting Strength of Foundations

Sir: Mr. Knappen and Mr. Philippe are to be complimented on their presentation of the problems to be encountered in investigating the stability of a foundation (April 23, 1936). It should stimulate considerable thought on the subject. The writer is extremely interested in all investigations that will give further information on the stability of earth fill over soft clay foundations. He worked on this problem as early as 1929 on levee construction in the Vicksburg Engineer District and developed a practical method of designing levees over old lake beds (1). Empirical constants were derived from actual failures and applied in future designs. Stable levees were constructed over most treacherous soft clay foundations by the use of this method. The writer realized, though, that this method based on empirical constants must be applied cautiously on other materials than those from which the constants were derived. During the past six months he has made, under the direction of Lieut. Col. T. B. Larkin, District Engineer, Fort Peck District, a detailed investigation on the foundation under the closure section of the Fort Peck Dam.

In this investigation the writer approached the problem in a different manner than was used by the authors. He will not attempt to describe here all the details of the method used, since they can be found in a paper (2) to be presented to the International Conference of Soil Mechanics and Foundation Engineering in June. He will mention here only the most important points that differ from the analysis made by the authors.

In determining the shearing strength after partial consolidation the following formula was used by the writer: $S = S_q + (S_c - S_q)Q$, where S is the actual shearing strength at a given per cent of total consolidation, S_q is the shearing strength as determined from a "quick" shear test in which the sample is not allowed time to adjust itself to the increased vertical load, S_c is the shearing strength as determined from a consolidated shear test where 100 per cent consolidation is allowed, Q is the per cent of total consolidation for the applied load as determined from consolidation tests.

The "quick" shear tests represent the condition where practically no consolidation occurs in the foundation, which gives an impossible minimum value. Consolidated shear tests represent the condition where the foundation is fully consolidated for the applied load; this condition is very seldom reached in clayey material during the period of construction. It is obvious, therefore, that the actual shearing strength due to partial consolidation must lie between these two extremes. Using the data from either one of these tests separately would give incorrect values of the true strength.

It is believed that the above method of computing the true shearing strength of a clay will give much closer results than that suggested by the authors. Use of actual test results eliminates the uncertainty as to the exact action within the soil when the vertical load is increased. The "quick" shear tests give the shearing strength which the soil would have if practically no consolidation occurred after the vertical load is applied; therefore the effect of the hydrostatic excess due to an increase in load is reflected in the shear values. If the full increase in load were carried by the water, the coefficient of friction as determined by the "quick" shear tests would be zero; but this is not the case, as shown by the shear test submitted by the authors. The writer agrees that the method used by the authors results in minimum values for the shearing strength, but this method will result in an unwarranted cost of the structure.

In the derivation of the formula $c = Pa/L$, Jurgenson has emphasized the fact that no consolidation must be allowed. Hencky and Prandtl (5) in their papers state that "friction was neglected" in the solution of the case where a plastic material is squeezed between rigid boundaries. The authors have taken into consideration the effect that consolidation has in increasing the strength due to the effect of friction, but have neglected its effect on the derivation of the formula $c = Pa/L$.

It was noted particularly that the authors omitted the use of Jurgenson's "squeeze" test as a means of determining the strength. It would be interesting to know why this test was not considered applicable for determining the shearing strength, since the basic solution by Hencky and Prandtl for the case where a plastic material is squeezed between two rigid plates was used for deriving both the "squeeze" test formula for shearing strenth, $C = Pa/BL^2$, and the formula $c = Pa/L$, the necessary strength of the foundation material to prevent ultimate failure. If the "squeeze" test formula does not give reliable strength results, it is not understood why the formula $c = Pa/L$ can be expected to give correct results when used to determine the strength of a foundation.

The authors' reason for using the

weakest strata as a basis of design was that "the Jurgenson formula for the limited case does not give the location of the maximum stress zone in the foundation." Jurgenson states (3) (p. 219) that "the shearing stress along the boundaries *AC* and *BD* (Fig. 6) is constant and equal to *Pa/L*." The boundaries referred to are the base of the fill above the plastic strata, and the rigid boundary below it (see the authors' Fig. 16).

In using lead shot to represent the embankment, and gelatin to represent the foundation in the photo-elastic models, two major errors were introduced. In the first place, the stress pattern in a foundation is materially affected by the stress distribution in the embankment. This is true whether the embankment and foundation are one homogeneous material, or whether they are each composed of a different material. Proof of this fact can be found in the paper submitted by the writer to the International Conference on Soil Mechanics. Due to the density of lead shot, it is impossible to construct the fill and foundation to the same scale; therefore the true stress pattern in the foundation cannot be duplicated by this type of model. Also, the relative rigidity of the shot embankment and the gelatin foundation differs so greatly from the conditions found in an actual earth prototype that the distribution of the embankment load on the foundation is not at all correctly simulated.

The writer is of the opinion that the formula $c = Pa/L$ cannot be used to correctly determine the degree of safety of the foundation under an embankment, for the following reasons:

1. The basic mathematical analysis from which this formula was derived assumed no friction in the plastic material, when this is practically never the actual case.
2. The mathematical analysis also assumes the ends of the plastic material to be free. This could be the actual condition only if deep trenches were placed at either toe of the embankment, which is never the case. The fact that the free end condition is not obtained affects considerably both the stress pattern and the strength of the plastic layer.
3. The stress distribution in the foundation is materially affected by the condition assumed for the upper boundary. Since the upper boundary condition influences the stress pattern to such a great extent, it is not believed that the assumption of its being solid and hard is justifiable. The bottom surface of any kind of earth embankment could never be considered relatively rigid with respect to the foundation material.
4. The shearing stresses produced by a triangular earth embankment on a layer of clay would not be constant and equal to $C = Pa/L$ even if the clay happened to have the theoretical zero friction value.
5. The use of the formula for determining the maximum stress in a foundation, and comparing this with the shear values of the weakest strata encountered can easily lead to absurd results under certain conditions.

It is believed that much more accurate results can be obtained by determining the stresses in a foundation from Carothers' basic formulas for stress along a rigid boundary and in a homogeneous material of infinite depth, and comparing this stress pattern with the mean shearing strength of the foundation strata.

T. A. MIDDLEBROOKS
Fort Peck, Mont.,
May 20, 1936.
U. S. Engineer Office

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[The authors make the following comment on Mr. Middlebrooks' discussion—EDITOR.]

Sir—Mr. Middlebrooks, in his interesting comments, has brought out a number of considerations which are most pertinent to the matter of foundation design for embankments. Naturally, most of these matters have received our prior consideration in deciding on the soundest methods to apply in preparing the designs for this important work. As he has indicated, there are a number of assumptions made as a basis for calculations which accord only approximately with what occurs in nature. The designer, in each case, must be careful to insure that the assumptions are valid for the case under study.

In line with Mr. Middlebrooks' comments on the "berm design method" developed in the Vicksburg District, the validity of the design methods outlined by the authors was checked against a number of questionable levee foundations in that district. The results of the tests and stability computations accorded with the actual behavior of the prototype in each case. In one case where the levee was designed with berms, our computations indicated that failure would take place. This was verified by the actual occurrence. In two other cases, failure that occurred was predicted. The formula $S = S_q + (S_c - S_q)Q$ would show these designs to be safe in each case. The reason for this lies in the fact that the behavior of clays under shearing load cannot be treated as simply as by this formula. The results secured by many investigators indicate that conservative assumptions, such as have been used by us, should be followed until more positive information on the basic laws governing shearing in clays is available.

Relative to the comments on Jurgenson's formula $c = Pa/L$, Dr. Jurgenson has prepared a paper, to be published shortly, which paper it is believed will clear up the uncertainties that the above letter suggests. In view of this, the authors do not feel at liberty to discuss this phase further. The squeeze test was used extensively in the Zanesville laboratory for determining the shearing characteristics of soils, but because of its limited application was not discussed in the Muskingum articles. When used within its limits it gave excellent verification of the results of the quick shear tests.

In further clarification of the interpretation of the results obtained with the photo-elastic method, it should be pointed out that two extremes exist. The first is the case of a comparatively rigid embankment on a highly elastic foundation. The second is the case of an embankment and foundation having similar moduli of elasticity. Our investigations have been made for the first case using lead shot for the embankment, and for the second case using gelatin for the embankment. Results obtained in the second case indicate stress intensities about 50% to 75% greater than in the first case. It is our judgment that in no case have we had sufficient variation from the conditions outlined for the first case to warrant applying a correction to the results obtained.

It should be emphasized that the determinations of shearing stresses and shearing strengths are unrelated and must be treated separately. Now, referring to the last paragraph of the above letter, and taking up the determination of stresses: If it is meant to suggest the use of Carrothers' formula for stress along a rigid boundary and in a homogeneous material of limited depth, the results of such determinations should be satisfactory and should give results comparable with those outlined by the authors. The preceding comments are applicable equally to the use of this formula. If it is intended that Carrothers' formula for the use of an infinite depth of homogeneous material should be applied to an actual condition of limited depth, then one may indeed expect to be "led to absurd results."

Designing a foundation based on the average strength of the material in the clay strata may, and probably will, result in close cases in causing overstress and partial if not complete failure in the foundation. We do not consider it sound engineering practice to allow any condition of overstress; certainly, it is not tolerated in other rational methods of structural design for permanent structures.

T. T. KNAPPEN AND R. R. PHILIPPE
Zanesville, Ohio.
June 1, 1936.

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June 25, 1936

Competence Versus Inspection

THE APARTMENT HOUSE COLLAPSE in New York City last Friday is not the first and will not be the last tragedy of the kind. It is a sharp reminder of the principle that sound building is a matter of public concern and of professional responsibility—a principle little regarded in practice. While the precise causes of this latest failure remain to be determined it may be said that many buildings have collapsed before this one, and almost always under similar circumstances. The red thread that runs through the record is the absence of a responsible engineer or architect and of a competent, thoroughly experienced builder. Such failures should never happen and need never happen, for the art of good building is well established, and it is known that competent design and experienced, conscientious construction give no room for failure—the rare case of a mishap due to chance or to stress of unusually difficult conditions excepted. But though engineering and architectural groups have often urged as a remedy that building shall always be directed with competence, by requiring a structural engineer to be in competent charge and by requiring builders to be qualified and licensed, their proposals have uniformly been ignored. The average legislator, perhaps also the average citizen, believes that anyone can build, and resists the suggestion that building ought to be limited to men of known competence. Yet the truth is that building will always be dangerous in unskilled hands or when lacking the responsibility that goes with professional competence. So long as this fact continues to be ignored and reliance is placed on the always overworked public building inspection, failures are bound to recur.

Sex in Sewage

FREUDIAN PHILOSOPHY holds that sex impulses are the motivating element of all human activity, and now Dr. Bach, eminent German sanitarian, goes a step farther by announcing that sex-hormones in sewage are an influence in shaping plant growth fertilized by the sewage. As reported in an item in this month's Current Notes on Sewage Disposal (p. 923), Dr. Bach, who has been making a study of the value of sewage for crop irrigation, comes to the conclusion that the chemical values and moisture contributed by sewage are of small importance compared to certain mysterious "stimulating values," which latter he attributes to the presence of sex-hormones and vitamins. This interesting disclosure may be an answer to the question raised by agriculturists, who before now have noted that the fertilizing value of sewage sludge is considerably greater than chemical analysis of its constituents would indicate. What other inferences can be drawn from Dr. Bach's announcement only time will tell. Suffice it to say that sanitary engineers, while deeply engrossed in their studies of B.O.D., the sludge index and other strictly technical quantities, apparently are not overlooking more recondite matters that may be connected with their subject.

Public Housing Defeated

IT IS WELL that the expiring Congress killed the housing bill, for it was in all respects premature, hasty legislation. The principle of public housing which it sought to establish has not gained the support of the people, and the bill has been discussed too little to justify its adoption. The strongest argument against the bill, however, was that it did not express a sincere desire to improve housing, for it did not strike at the real evil of either bad housing—lack of enforcement of proper standards—or the more general evil of the housing situation—its unhealthy financial practices. Competition from a small amount of public housing would be powerless to reform these practices, and at best it would attack bad housing in a roundabout way. Bad housing can be fought by enforcing the laws that require safe provision against structural, sanitary and fire risks; and this is the direct and honest way. Similarly, direct ways should be found for rooting out bad financial practices and reforming the antiquated mortgage system. The indirect way through public housing is objectionable both because it is ineffective and because it would lead us into a system that should be adopted only on clear expression of the people's desire for its adoption.

Organizing for Cooperation

BY POPULAR DEMAND strengthened by the current tendency to put everything possible on Uncle Sam's shoulders, flood control has been made a national responsibility through the so-called omnibus flood bill just enacted by Congress. A remnant of local responsibility remains, in the provision for contributions to the cost, but all initiative is centered in the national government. Even now however, it is constructive to look at what can be accomplished through resolute action by the local interests themselves. What was done under the Ohio conservancy act to protect the communities of the Miami River valley in that state, twenty years ago, still stands as a model example. Important work has been done also in New York, though under a law of much more restricted scope. It appears from E. S. Cullings' study of this subject, on another page of this issue, that slight revision of this law can make it adequate for broad flood protection service. Such provision for organizing local regions for cooperative action ought, of course, to be on the statute books of every state. Equipped with enabling means of this kind, communities can find real opportunity for applying their faculties of self-reliance and self-help.

Unfortunate Though Desirable

THE FLORIDA SHIP CANAL has joined the Quoddy tidal power scheme in abandonment. Both were begun without proper Congressional approval under an interpretation of an act of Congress that clearly was not intended to be interpreted as authorizing works of such magnitude and character. Both called for large expenditures extending over several years, expenditures that should have been specifically authorized by Congress after careful study. Now that proposals to continue the ex-

penditures have come before Congress for the first time both have been rejected. And though few will not agree that the rejection is desirable to avoid an unjustifiable expenditure of large sums of money, endorsement of the action cannot but be tinged with regret over the dissolution of the engineering and construction organizations set up for each project. In both instances the army engineers have set up an efficient body that has gone at the task assigned to it with enthusiasm. Large numbers of men have been assembled, and in the case of the canal, contractors have brought in a considerable plant. To all of these men abandonment of the projects cannot but be a keen disappointment; to many it means seeking new jobs and a considerable financial loss. But finally, viewing the subject abstractly, despite the immediate disappointment and difficulties, what Congress has done serves but to reassert its determination not to undertake work of this character until it has been studied, and favorably reported upon, by the army engineers. This cannot but bring satisfaction to the profession as a whole, despite the disappointment of the individuals at Ocala and Eastport.

Hydrostatic Uplift

A LIGHT is thrown upon the obscurities that have beclouded the ancient subject of hydrostatic uplift on structures such as dams and headgate frames by the observations reported by Dr. Karl Terzaghi in last week's issue. For generations past, engineering news on uplift action have ranged rather uncertainly between the two extreme assumptions of no uplift pressure and full water-head pressure, according to whether the engineer considered his structure and foundation to be substantially impermeable and flawless or subject to local defects and the development of cracks. In fact, the few who held to the full-pressure view were usually controlled more by their expectations of extensive crack formation than by regard to the influence of porosity.

As to whether porosity of rock, soil or concrete in the absence of seams or cracks is sufficient to permit of large uplift ratios there has been a vast amount of discussion. For the present this question seems to be decided conclusively by the experimental observations now reported, which show that the effective porosity, so far as creation of uplift is concerned, is to all intents and purposes 100 per cent. Unquestionably the conclusion must lead to more ample provision for uplift. Present practice regarded as conservative widely uses a pressure ratio of 50 per cent at the water side and linear variation down to zero at the free toe; but on the basis of the new experimental results this allowance must prove inadequate except where drainage is sufficiently free to cut down the uplift by half within negligibly short distance of the water face.

It goes without saying also that thorough drainage of foundation beds, of superstructure and perhaps in many cases of the subfoundation strata must command more care in future than it has been given heretofore. The fact remains that uplift unless neutralized by drainage is a living force, to be opposed by material rather than by argument. Proof of 100 per cent water-contact area in substances even so solid as dense concrete therefore brings us face to face with a fact that compels scrupulously careful attention.

Who Owns a Power Site?

AT this time, when questions relating to stream development are much in the public eye, it is useful to recall a finding on the ownership of power sites which was made in the course of suits over the value of land at the Grand Coulee site, in the state of Washington. A principle there brought out, though it had only indirect bearing on the question before the court and jury, overthrows many views commonly entertained as to the ownership of power sites.

It appears that the owners of land along the banks of a navigable stream have no right to build a power dam until such rights are specifically granted by Congress. Until then the property owners could build down to low water but could not build farther. Accordingly, their ownership does not include the potential ownership of a power structure, and it was held at Grand Coulee that the value of their property does not include a value based on the right to build a power dam. Owners of land along navigable streams therefore have no claim against the government for the value of a dam site which the government may elect to develop.

Judge Webster said in the Grand Coulee case:

> The Congress of the United States has absolute control over the navigable streams within the borders of the country . . . The landowner owning these adjoining shore lands is not entitled to have any allowance made to him based upon any title to the bed of the stream or any allowance made him for any right that he has because of the water running in the navigable stream or its potential waterpower.

With even greater authority the United States Supreme Court in an earlier case, which Judge Webster cited, and which Chief Justice Hughes also cited in the TVA decision (U. S. v. Chandler-Dunbar Co., 29 US 53, relating to land in Michigan between the St. Mary's River and the ship canal strip of the government), clearly defined the limits of the riparian owner's rights. In the language of Mr. Hughes in citing the case:

> We said that the government "had dominion over the waterpower of the rapids and falls" and could not be required to pay "any hypothetical additional value to a riparian owner who had no right to appropriate the current to his own commercial use."

These citations firmly establish that a power site on a navigable stream does not attach a power-site value to the riparian lands over which a dam would extend.

A somewhat parallel view of the law governing the respective rights of private owner and public was applied in later litigation, also at Grand Coulee, over the taking of land on which the gravel pit that supplies the work on the dam was developed. "Because the government happens to be building a dam, property owners should not receive more than their property would have been valued had the dam not been built," said the judge. The point, of course, is that the gravel had no use and its possession no value to the owner of the land. It would never have been developed but would have remained a mere geological formation had the government not decided to build the dam. The private owner therefore lost nothing more than the bare value of the land, which was semi-arid land suitable only for grazing purposes.

Consistent application of the principle embodied in the St. Mary's River and Grand Coulee cases to all condemnations for improvement works should do away with many difficulties and abuses that now affect construction enterprises.

CURRENT NEWS

Building Collapse Kills Seventeen

Large apartment house under construction in New York City wrecked by the collapse of central section

COLLAPSE of an apartment house, in course of construction, in the borough of The Bronx, New York City, on June 19, 1936, resulted in the death of seventeen workmen and the serious injury of eight others. Three more suffered abrasions or lacerations which did not require hospitalization.

The building, which has a frontage of 200 ft. on East Mosholu Parkway South, consists of three wings, separated by light courts extending back from the street line to the rear section connecting the wings. Under those provisions of the multiple dwelling law which define a basement and fix the curb level, the building is rated as a six-story and basement structure. Along the entire length of the parkway front, however, there are virtually seven full stories, this condition being possible because of the steepness of the grade on the shorter frontage on East 206th St.

The structural work, that is, exterior brick walls, steel girders and the wood-joist floor construction with the rough flooring, and interior partition studding, had been completed to the roof level. A brick tower, intended as an ornamental feature, was under construction over the central portion of the middle wing. It was located a short distance back of the front wall and was supported by steel girders resting on the brick walls. It is reported that material for this tower had been concentrated at this point and that work was being rushed toward completion. It was this tower with its supports and about one-half of the front wall of the upper three stories that crashed to the basement carrying with it the several tiers of wood-joist floors.

The disaster occurred at 3.30 p.m. Most of the victims were in the third story of the middle wing where workmen were being paid off at the time.

The cause of the collapse has not been determined. The district attorney of Bronx County has started an investigation preparatory to placing facts before a grand jury that may possibly fix criminal liability. Permission to examine plans of the building or view the ruins have been denied except to his own investigators.

The building was designed to accommodate 60 families. Louis Steinberg of the Bronx is said to be the owner and builder, most of the work being let out in subcontracts.

Wide-World Photo

FAILURE OF THE SUPPORTS of a tower over the central section of the middle wing of the building is believed to have been the initial cause of the collapse.

Florida Taxpayers Must Approve PWA Loans Repayable From Taxes

The Florida Supreme Court on June 13 handed down a decision stating that in all cases where PWA loans may be repaid by taxes the approval of taxpayers must be obtained before the loan is made. Loans amounting to $111,345,067 will be affected by this decision.

The Florida court recently (*ENR*, June 4, 1936, p. 823) held that in cases where the loan is guaranteed only by income from the proposed project, and payment from taxes cannot be required, no vote is needed.

Congress

A summary of bills of interest to engineers and contractors passed in this session of Congress

MUCH LEGISLATION covering engineering and construction was enacted by the past session of Congress. Appropriations, in the main, were generous and many other bills were enacted that are of direct interest to engineers and contractors.

After hanging by a thread for months, an appropriation of $300,000,000 was made for continuing the PWA program of non-federal projects. The compromise was reached by taking this money out of the revolving fund derived by PWA from the sale of collateral purchased in financing non-federal projects in the past. President Roosevelt had refused to permit Congress to earmark for public works any part of the $1,425,000,000 appropriated for continuing the work relief program, of which WPA is the principal unit.

ON THE WPA work relief program, prevailing wages and actual need of individual applicants for work relief will be determined locally. The rate per hour prevalent where the project is under way will be paid in each class of work, the employees working only enough hours per month to earn the monthly "security" wage they are now getting. State WPA Administrators will gather the necessary facts to set the hourly rates. Work on projects which have already been approved will be continued without resubmission of those projects to Washington. New projects must be originated by local communities and submitted, just as they have been.

After a long fight, Congress finally refused to authorize either the Passamaquoddy tidal power project or the Florida canal and provided that no money should be allotted from the new work relief appropriation for continuing construction.

THE MORATORIUM on repayments on reclamation projects was extended on 50 per cent of payments due this year. Congress enacted a law sponsored by Senator Hatch, of New Mexico, for the appointment of a commission to investigate and recommend, in its discretion, a revised system covering repayment by settlers of the cost of reclamation projects, but this will have to go over until next year as no money was provided to cover the commission's expenses.

A FAVORABLE outcome on the reclamation program followed a long controversy between the House and Senate, the former objecting to inclusion by the Senate of projects that were not included in the House bill. A compromise was effected by reducing the amount appropriated. This includes $20,750,000 for Grand Coulee, $9,600,000 for Boulder Dam power plant, $6,900,000 for Central Valley covering Friant dam and the Madera and Friant-Kern canals, $6,500,000 for the All-Ameri-

can canal and $10,860,000 for other reclamation projects. The last item is appropriated from five-year accumulations in the reclamation fund.

Congress passed the Rio Grande canalization bill authorizing an appropriation of $3,000,000 in addition to a previous authorization of $1,000,000 for the proposed American diversion dam near El Paso and a canal to a connection with the present Franklin canal of the Rio Grande irrigation project.

THE NEW federal-aid highway bill authorizes a total appropriation of $476,000,000 for 1937 and 1938 combined, including $100,000,000 for grade crossing elimination. The apportionment for grade crossings does not have to be matched by the states.

Congress enacted the Carmichael bill to cover, out of federal-aid highway funds, 50 per cent of the construction cost of any toll bridges on federal-aid routes built since March 3, 1927, and which are made free prior to July 1, 1938. By another law all publicly owned interstate bridges are exempted from federal, state and local taxation. The Chesapeake Bay Authority was authorized to build a toll bridge from Baltimore to a point near Tolchester, Maryland. A bill creating a commission to recommend the clear height above water of the Hudson River bridge which the North River Bridge Company previously has been authorized to build at 57th Street, New York City, failed of enactment.

FOR FLOOD control, Congress authorized an appropriation of $300,000,000 for projects throughout the United States, and defined a policy with respect to flood control which accepts it as a federal responsibility in cooperation with the states. In addition, Congress authorized an appropriation of $272,000,000 for carrying on the Markham flood control plan for the lower Mississippi River. By another law New England and Ohio valley states were authorized to enter into compacts for the planning and execution of flood control projects. Because of the large authorizations for flood control, Congress enacted legislation increasing the commissioned strength of the Corps of Engineers by 185 officers and vesting complete jurisdiction over surveys, planning, and improvements in the Corps. By another law the Beach Erosion Board is empowered to function in the same way as the Rivers and Harbors Board of the Corps of Engineers, and will recommend projects for authorization by Congress.

THE Walsh-Healey bill, enacted in the closing days of the session, provides that all government contracts for "materials, articles, supplies and equipment" in excess of $10,000 shall be awarded only to contractors observing a 40-hour week and paying wage rates prevailing in the community. By its terms the bill apparently excludes construction contracts, but there seems to be some room for a broader interpretation. The new law represents an attempt to perpetuate principles established by the invalidated NRA.

To provide more adequate protection for workmen on projects under construction on federal government property Congress enacted a law granting jurisdiction and authority to the states to enforce state workmen's compensation laws on the premises. A specific example is the Golden Gate bridge, with reference to which the courts have held that the state laws do not apply.

SEVERAL BILLS of major importance failed of enactment but will be revived in the next Congress. A bill establishing federal control of stream pollution passed the House but made no further progress. The public housing bill sponsored by Senator Wagner to create a U. S. housing authority and finance by 45 per cent grants housing projects initiated by local authorities passed the Senate but died in the House banking committee. Bills permitting the Public Works Administration and Resettlement Administration to pay service charges in lieu of local taxes in the communities where their housing projects are located were enacted.

Legislation sponsored by the administration that would have vested authority in the Federal Power Commission to fix rates on all power produced on federal projects was favorably reported by committees in both houses but not acted upon by either. It is expected that the bill will be reintroduced next session. As originally introduced it was confined to the Bonneville project, but its scope was extended by an amendment that has broad implications with respect to the government's power policy, as it apparently would give the Federal Power Commission jurisdiction over the rates charged for the sale of TVA power and also for power produced on reclamation projects.

Louisiana Repeals Anti-PWA Laws

The Louisiana legislature has repealed two laws, passed under the influence of the late Senator Huey P. Long, which made the carrying out of PWA projects in Louisiana very difficult. The first of these bills required approval of PWA expenditures by the state highway advisory board. The second made it a crime for a federal official to exercise any function in Louisiana not delegated by the United States Constitution.

The Louisiana legislature has also completed action on a proposed constitutional amendment providing for the issuance of $30,000,000 of highway funds (*ENR*, June 18, 1936, p. 897).

A bill has also been passed creating the Louisiana Flowage Rights Commission to administer claims arising out of the construction of spillways under the federal Overton flood control bill.

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Nebraska Power Project To Go Forward with PWA Funds

An injunction suit begun by five utilities against three Nebraska power and irrigation projects has been postponed until fall and will probably never be tried as a new injunction is accepted by both sides. This new arrangement bars the government plan to unify the marketing of power, but allows the completion of the three projects along the original plan, using PWA funds. The unification of marketing was recommended by a special committee last December. The new arrangement, however, allows the Loup River and Platte Valley projects to be connected.

New York State Sets Up Traffic Body

Broad powers to coordinate traffic laws given commission—New duties for Bureau of Motor Vehicles

GOVERNOR LEHMAN has signed a bill, introduced into the New York legislature by Assemblyman Heck, creating a permanent State Traffic Commission, which is to be headed by the Commissioner of Motor Vehicles. The commission is to be under the Department of Taxation and Finance and will include, as ex-officio members, the Commissioner of Highways and the Superintendent of State Relief. The commission is given authority to adopt such rules and regulations as it may deem necessary to effectively accomplish its purpose. Violation of such rules is punishable by fine and imprisonment.

The commission is further required to make an annual report to the legislature. The report will include the commission's proceedings and recommendations, and may include recommended legislation necessary to put such recommendations in effect.

Among the duties of the commission is the regulation of the type, location, erection, maintenance and removal of all traffic control lights on state highways outside of cities. All such lights are, in future, to be maintained at the expense of the state. Similar authority is given the commission in regard to traffic signs. The commission may also order the erection of suitable direction signs along city streets, provided consent is first secured from local authorities. The commission is also required: to formulate uniform highway safety programs and coordinate the efforts of all interested individuals and agencies engaged in safety education; to advise and assist the officials of cities and villages with their traffic problems; and to cooperate with such officials toward the adoption of uniform ordinances, signs, signals, lights and marking; to maintain a continuous survey of traffic conditions on the public highways of the state.

An appropriation of $20,000 for the use of the commission has been signed by the Governor.

New safety laws

A number of new highway safety laws have also been signed. An appropriation of $100,000 has been provided for the Bureau of Motor Vehicles to cover additional expenses incurred as the result of the new regulations. The new regulations include: (1) An amendment to the state labor law limiting to ten the hours which a truck driver may continuously operate his truck. The amendment also requires that a driver should carry a time card with him at all times. (2) An amendment to the vehicle and traffic law making it unlawful to operate a vehicle so constructed or loaded that the driver is unable to indicate clearly by hand signal his intention of stopping or turning, unless the vehicle is equipped with a mechanical signaling device. (3) An act limiting the maximum length of a single vehicle to 35 ft., and the length of a truck-trailer combination to 50 ft. (4) an act providing that convictions of vehicle and traffic law violations must be recorded upon the driver's license. (5) An act providing that applicants for learner's permits must submit to a vision test.

Public Health Conference at Southport, England

The United States government has accepted an invitation extended by the British government, on behalf of the Royal Sanitary Institute, to be represented at the 47th congress of the Institute, to be held at Southport, England, from July 6 to 11, 1936. The official delegates to the convention will be: Dr. Hugh S. Cumming, Surgeon-General, United States Public Health Service, retired; Dr. H. A. Spencer, senior surgeon, United States Public Health Service. Dr. Spencer, who is in charge of public health service activities in London, also represented the United States at the 46th congress of the Institute in 1935.

The congress will include a special section on tropical hygiene, and practically every branch of public health and sanitation will receive attention.

Endowment for Detroit Society

Rackham fund establishes half-million dollar endowment for Detroit engineering society

AN ENDOWMENT of $500,000 has been provided, from the $13,000,000 Rackham fund, for the newly organized Engineering Society of Detroit. The Engineering Society of Detroit draws its membership from all the engineering, architectural, and allied professions in the Detroit area. It was incorporated last April in order: "to unite in an educational manner for the welfare of the public within the Detroit area all . . . persons engaged in professions allied to the engineering and architectural arts and sciences; to increase the personal efficiency of engineers and architects and persons in allied professions; to provide library services, lectures, publications and instruction on subjects tending to improve or increase the technical skill and social usefulness of persons engaged in engineering activities; to assist the general public in understanding questions involving engineering problems; to aid in promoting research and investigation of engineering problems of public interest."

The new society takes over the function and membership of two existing societies, the Associated Technical Societies, and the Detroit Engineering Society, the name of which was recently changed, to avoid confusion, to the Old Engineering Society. These two societies will shortly dissolve.

The half million dollar endowment will be administered by the Rackham Engineering Foundation, incorporated on June 12, 1936. The president and most recent past president of the Engineering Society of Detroit are ex-officio members of the board of trustees of the foundation. The income from the fund goes to the Detroit society; moreover, the trustees of the foundation have the discretionary power to devote a portion of the principal to the building of a permanent headquarters for the society. One quarter of the annual income may be used to investigate and report on projects proposed or under way in the Detroit area.

The officers of the Engineering Society of Detroit are: John H. Hunt, president; Harold F. Ellington, first vice-president; James W. Parker, second vice-president; Clair W. Ditchy, secretary; Ellsworth J. Burdick, treasurer; John W. Kennedy, assistant treasurer; and Ernest L. Brandt, managing secretary.

Standish Backus, Alex Dow, Edsel B. Ford, Bryson D. Horton, and William F. Knudsen are trustees of the Rackham Engineering Foundation, appointed for life. John H. Hunt, president of the Engineering Society, and, in the absence of a past president, Ellsworth J. Burdick, treasurer of the society, are ex-officio members of the board of trustees.

Virginia Engineers Organize a State Professional Society

The Virginia Society of Professional Engineers has been organized with E. M. Hastings, chief engineer of the Richmond, Fredericksburg & Potomac R.R., as president, and R. Cooper Bailey, system control engineer of the Virginia Electric & Power Co., as secretary. The charter members include the presidents of the Virginia sections of the Am.Soc.C.E., Am.Soc.M.E., and A.I.E.E. Application by the Virginia Society for a charter has been granted by the National Society of Professional Engineers. This makes the twelfth member state society of the National Society of Professional Engineers.

Good Progress Being Maintained On PWA Housing Projects

Contract for the construction of foundations on five blocks of PWA's $5,500,000 Brewster slum clearance project in Detroit has been awarded to the Martin and Krausman Co. of Detroit, on a bid of $89,000. The entire project will replace 11 blocks of substandard housing, providing quarters for 791 families. Houses in the Brewster development will consist of three-story apartments, two-story group houses, and a few two-story flats. Buildings will cover only about 25 per cent of the project area. Bids on construction of foundations for the remaining sections of the project will be taken shortly.

The H. S. Baird Co.'s bid of $850,317 for erection of the superstructure of Durkeeville, PWA's million dollar low-rent housing project in Jacksonville, Fla., has been accepted. Construction of foundations, also awarded to the Baird Co., is nearly complete. The Durkeeville project will house 239 families in one and two-story group houses, built of reinforced concrete. The plans call for 241 separate structures arranged in 41 building groups.

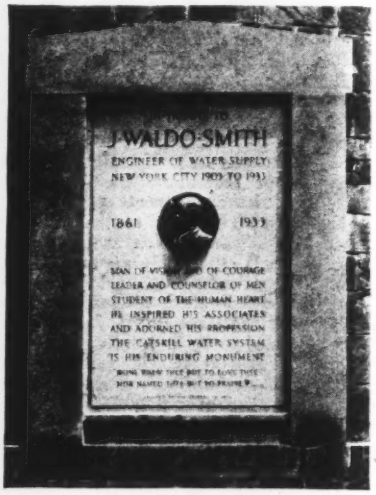
Lane, Ogle, Inc., of Woodbury, Conn., have been awarded the contract for the construction of buildings at Fairfield Court, the housing project at Stamford, Conn., on its bid of $690,956. Foundation construction on the project is nearly complete; Frank Palmer, of Stamford, is the contractor on this work. The project, which will cost $800,000, will provide housing for 154 families.

Foundation construction has been completed at Harlem River Houses, one of two projects under construction in New York City. The project includes seven groups of buildings containing 574 apartments. The total cost of the four blocks of land and of the building is estimated at $4,700,000.

PWA now has 50 projects under way. When completed, these projects will house more than 100,000 persons.

Memorial to J. Waldo Smith Unveiled at Ashokan Reservoir

A tablet in memory of J. Waldo Smith, engineer of the Board of Water Supply of New York City from 1903 to 1933, was unveiled at the Ashokan reservoir in the Catskill Mountains, New York, on June 25. This tablet has been placed on the triangulation tower overlooking the Olive Bridge dam and the reservoir. The tablet and its enclosing frame is of Barre granite, 12 ft. high by 8 ft. wide. Near its center is a 19-in. diameter bronze relief medallion of the features of Mr. Smith.



MEMORIAL TABLET to J. Waldo Smith unveiled at the Ashokan reservoir on June 25.

The tablet bears the following inscription:

"In tribute to J. Waldo Smith, Engineer of Water Supply, New York City 1903 to 1933.

"Man of vision and of courage, leader and counselor of men, student of the human heart, he inspired his associates and adorned his profession. The Catskill Water System is his enduring monument. 'None knew thee but to love thee, nor named thee but to praise.'"

"Erected by his friends in 1936."

J. Waldo Smith was appointed chief engineer of the Aqueduct Commissioners of New York City in 1903. In 1905, when the Board of Water Supply was created for the purpose of obtaining an additional supply from the Catskill area, Mr. Smith was made chief engineer, and he served in that capacity until 1922 when he became consulting engineer of the board, which position he held at the time of his death.

On June 25 a large party of engineers and friends of Mr. Smith were present at the Ashokan reservoir for the unveiling of the memorial. The principal speakers were: George McAneny, former comptroller of New York City, now president of the Regional Plan Association and of The New York World's Fair; John F. Galvin, former commissioner of the Board of Water Supply and chairman of the Port of New York Authority, now director of port development of the Port Authority; and George J. Gillespie, president of the Board of Water Supply of New York City; all of whom served as commissioners of the Board of Water Supply at some time during Mr. Smith's service with the board.

Contractor Abandons Work On Highway Tunnel at Oakland

Work on the Broadway highway tunnel at Oakland, Calif., was stopped on June 13 by the contractor, Six Companies of California, due to difficulties with the owners, Joint Highway District No. 13. The work is about 70 per cent complete. The main part of the project consists of a twin-bore tunnel, 3,168 ft. long, through the Berekely Hills and a 4-lane highway, 2.2 miles long, from the west portal through Temescal Canyon to the intersection of Broadway and Keith Ave. in Oakland. Each tunnel is wide enough for a 3-ft. walk and a 22-ft. roadway. The tunnels are to be lined, and ventilated mechanically. The contract was let for $3,683,931.

The contractor is reported to have run into unexpected rock difficulties that delayed the tunnel work beyond the completion date of May 24; since then the district has been assessing the company $500 a day under the penalty clause of the contract. The contractor holds that the ground conditions to be met were misrepresented in the information furnished the bidder and asked for an extension of time. This the highway district denied. As a result the contracting company holds that it must withdraw from the contract in order to maintain its fundamental rights. The district has notified the bondsmen that the contract has been abandoned and that it will take steps to complete the project.

President Moves Against Collusive Bidding

President Roosevelt has referred to the Department of Justice, "for appropriate action," a report by the Federal Trade Commission that collusive bidding has occurred on steel sheet piling for certain construction projects financed by the Public Works Administration. The President has also asked that government purchasing agents collect evidence regarding instances where there has been collusive or identical bidding, and has requested the Attorney-General to prepare legislation to be submitted to the next Congress, making "present unfair practices unlawful."

In the course of its investigation of complaints of collusive bidding, the commission states that it found that there was reasonable ground to believe that the anti-trust laws have been violated. The commission found that the production of steel sheet piling is concentrated in the hands of four concerns, the United States Steel Corp., the Bethlehem Steel Corp., the Jones & Laughlin Steel Corp., and the Inland Steel Co. All four companies were bidders on the three projects involved in the investigation, the Triborough Bridge at New York City, the Deep Sea Harbor project at Miami, Fla., and an ocean terminal at Moorehead City, North Carolina. The commission reported that these companies admitted they quoted identical prices because they were acting in accordance with the policy of the industry continuing in effect the provisions of its former NRA code with regard to the basing point system of delivered prices.

The report stresses the "broader significance of the conditions typified by the collusive bidding on sheet piling." It points out that the entire price structure of the iron and steel industry is the result of an elaborate concerted action among supposedly competing interests.

High Wind at Fort Peck Dam Causes Loss of Core Pool

Waters of the long, shallow core pool in the Fort Peck hydraulic-fill dike were piled against one end of the fill by a sudden violent windstorm late in the afternoon of June 15, resulting in overtopping the dike with the loss of all pool water and of about 15,000 cu.yd. of core and shell material. At the time of the accident the core pool was 7,200 ft. long, 60 ft. wide and about 5 ft. in maximum depth. The water broke through a low spot in the upstream levee of the dike close to the eastern end of the fill, near the junction of the dike and the main dam.

The dike, extending 11,500 ft. westward from the western end of the main dam, is being built by hydraulic fill with material dredged from the Missouri River and pumped to place against a 210-ft. head. One of the four dredges designed to fill the main dam has been assigned to the dike this season. The dike is about half completed at this time.

The break in the levee, the washed-out section of embankment, and the lost material in the core were replaced in short order by draglines borrowing from a high temporary plug at the east end of the dike. Within 18 hours the gap had been closed and pumping was resumed. Clear water was pumped until the core pool reached its former level. Normal filling operations were resumed within 48 hrs. after the break occurred. The dike is being built up at an average rate of 43,000 cu.yd. per day.

SOCIETY CALENDAR

HIGHWAY SAFETY CONFERENCE, Ames, Iowa, June 29-July 2.

AMERICAN SOCIETY FOR TESTING MATERIALS, annual meeting, Atlantic City, N. J., June 29 to July 3.

AMERICAN SOCIETY OF CIVIL ENGINEERS, annual convention, Portland, Oregon, July 15-17.

CANADIAN GOOD ROADS ASSOCIATION, annual meeting, Charlottetown, P.E.I., September 1-3.

CANADIAN INSTITUTE ON SEWAGE AND SANITATION, Royal York Hotel, Toronto, Oct. 1-2, 1936.

THE NORTH AND SOUTH CAROLINA SECTIONS, ASSOCIATED GENERAL CONTRACTORS OF AMERICA, and SOUTH CAROLINA SOCIETY OF ENGINEERS, joint summer meeting: Myrtle Beach, S. C., July 10-11.

AMERICAN WATER WORKS ASSOCIATION, FOUR STATES SECTION, at its April 23 meeting in Baltimore, Md., elected the following officers: Chairman, EZRA D. WHITMAN; Vice-chairman, HARRY N. FREEBURN; Secretary-treasurer, CARL A. HECHNER.

ENGINEERING SOCIETIES OF NEW ENGLAND, at their annual meeting, June 2, elected the following officers: President, FREDERICK W. BLISS; First Vice-president, PROFESSOR HAROLD K. BARROWS; Second Vice-president, HOLCOMBE J. BROWN; Secretary, JOSEPH PETERSON; Treasurer, LEON F. JACKSON.

EXAMINATIONS for registration as Engineers, Land Surveyors and Architects will be held as follows:

SOUTH CAROLINA, examinations for engineers and land surveyors at the office of the State Board of Engineering, 1218 Senate Street, Columbia, S. C., July 14, 1936. Applications must be filed with the secretary of the board before July 2.

SOUTH CAROLINA, examination for architect's license, Sloan College, University of South Carolina, Columbia, S. C., Monday, July 6, 1936.

American Contractor to Build New Drydock at Callao, Peru

A graving dock is to be built in the harbor of Callao, Peru, in connection with the new Marine Terminal, opened to service in October, 1934. The new drydock, to cost about $1,365,000, will have an inside length of 550 ft., an inside width of 79 ft., and a depth over the sill at mean high water of 26 ft. Provision is made for setting the caisson gate at three different locations, making docking of smaller ships possible without the necessity for using the whole dock. The lengths so obtained will be 550 ft., 525 ft., and 402 ft. Provision is also made for future lengthening, so that at any date longer ships can be provided for at a minimum of cost and without changing the width. The dock will be of reinforced concrete throughout. All pumping equipment will be electrically operated, and the pump capacities are such that the dock can be completely emptied in 2 hr. and 40 min. The dock will be provided with electric winches and other similar equipment, also the necessary plant and equipment for cleaning, painting and repairs.

The location of the proposed dock is within the area protected by the breakwaters, and there will be permanent connections, both by rail and street, to the new terminal.

Callao handles about 800,000 tons of cargo annually. There are at present no drydock facilities available, for any but the smallest ships, between the Panama Canal and Talcahuano, Chile, a distance of almost 3,000 miles.

Contract for the construction of the dock was awarded on April 30, 1936, to the Frederick Snare Corp., New York. F. R. Harris, Inc., New York, will act as chief engineer and chief inspector for the Peruvian Government.

No Liability on Contractor For Accident on Closed Road

The Connecticut Supreme Court of Errors, on June 17, ruled in favor of the Lane Construction Co., of Meriden, Conn., the defendant in a damage suit arising out of a collision of an automobile with a manhole protruding above the pavement of a road being rebuilt by the contractor. The court ruled that the Connecticut statute, which permits the state highway commissioner to allow use of a highway under construction or repair at the driver's own risk, relieves the contractor, as well as the state, from any liability.

The decision stated, "The purpose of the statute would not be effectuated if only the state were free from liability. If a contractor . . . is denied immunity . . . either the state would be compelled to pay a higher price for the work because of the additional danger of liability which would rest upon the contractor . . . or the highway commissioner would in fact close highways under construction or repair, thus denying to the public the convenience the statute is intended to serve. The risk which a traveler using a highway closed by the commissioner under the statute assumes is the risk of injury due to a defect in the highway, to recover damages for which he would ordinarily be entitled, and the immunity which the statute establishes inures to the benefit of one who contracts to construct or repair the highway as much as it does to the highway commissioner."

Obituary

EDMUND F. DICKEY, manager of the Maryland Meter Works, died in Baltimore, June 20.

J. G. TEDERS, assistant engineer of the Baltimore & Ohio R.R., stationed at New York, died June 2 at the age of 60. Mr. Teders had been associated with the Baltimore & Ohio R.R. since 1899, and had served as assistant engineer since 1918.

J. TALBOTT TODD, president of the Commonwealth Construction Co. of Baltimore, died June 16 in Baltimore at the age of 50. Mr. Todd was a graduate of Lehigh University. He was assistant PWA administrator in charge of work in Baltimore city and county and in other counties of Maryland.

PHILIP CHRISTMANN, 65 years old, member of the firm of Christmann & Sons, contractors, Buffalo, N. Y., died June 19. He was at one time chairman of the Buffalo Board of Water Commissioners.

JOSEPH WALKER, pioneer highway contractor in New York State, died at his home at Mayfield, N. Y., on June 11, at the age of 80. Mr. Walker had been engaged in highway construction since the late nineties when the State's first highway program was undertaken. He is credited with having built the first bituminous macadam pavement contracted for by the State.

FRANCIS GORDON, who was chief construction engineer on the Assouan Dam in the Nile River, died in Burlingame, Calif., on June 17 at the age of 73.

AUGUSTUS J. PENOTE, president and founder of the Cleveland Trencher Co. and of the A. J. Penote Co., died May 9 in Cleveland, Ohio, at the age of 55. Mr. Penote was the inventor of the trenching machine manufactured by the Cleveland Trencher Co., and, as a contractor, installed underground cable and conduit systems and gas lines in many cities throughout the Middle West.

CONSTRUCTION STATISTICS FOR THE WEEK

ENGINEERING construction awards for the week total $47,365,000, of which $16,044,000 is private work and $31,321,000 public. Of the public, $21,777,000 represents state and municipal awards and $9,544,000 federal. Public work is below the high volume of last week but private work is higher. Corresponding values a year ago are: total, $31,825,000; private, $10,967,000; public, $20,858,000; state and municipal, $11,691,000; federal, $9,167,000.

Commercial and industrial buildings, sewerage, waterworks and earthwork, irrigation and drainage register gains this week. The classification totals are: commercial buildings, $8,775,000; industrial buildings, $4,270,000; public buildings, $9,355,000; streets and roads, $8,107,000; bridges, $4,016,000; waterworks, $2,027,000; sewerage, $2,242,000; earthwork, irrigation, drainage, $4,514,000; unclassified, $4,059,000.

The larger awards include: reconditioning electric power plant for Monongahela West Penn Public Service Co., Rivesville, W. Va., $2,000,000; six-story apartment, McClellan St. and Sheridan Ave., New York City, $740,000; superstructure, Durkeeville Housing Project, Jacksonville, Fla., $850,000; Harlem River Housing Project, New York, N. Y., $2,563,000; superstructure, Fairfield Court Housing Project, Stamford, Conn., $691,000; highways, in Missouri, $622,000; in North Dakota, $523,000; bridges in Ohio, $543,000; superstructure, Neches River Bridge, Port Arthur, Tex., $1,613,000; water supply line, Contract 1, Little Rock, Ark., $1,562,000; sewage disposal plant, Denver, Colo., $1,150,000; completing jetty, U. S. Engineer, Grays Harbor, Washington, $2,799,000; steel rails, tie plates, etc., for Missouri-Pacific R.R., St. Louis, Mo., $691,000; 8,000 tons, 6-in. steel pipe for gasoline pipe line between Augusta and Kansas City, for White Eagle Oil Co., Kansas, estimated at $1,500,000.

New capital for the week includes a transfer from federal to private investment financing through sale by RFC of $3,993,000 in PWA bonds. State and municipal bond sales for the week total $5,060,000 and corporate issues $1,624,000. The R.F.C. sold $4,935,000 Great Northern Ry. bonds.

CONTRACTS
(Thousands of Dollars)

	Weekly Average June 1935	Prev. 4 Weeks	Week June 25 1936
Federal Government	$6,704	$5,314	$9,544
State and Municipal	11,161	24,891	21,777
Total public	$17,865	$30,205	$31,321
Total private	9,675	12,799	16,044
Week's total	$27,540	$43,004	$47,365
Cumulative to date:			
1935..$657,271,000	1936..$1,121,375,000		

*Includes transfer from PWA to private investment financing through RFC sale of PWA bonds.

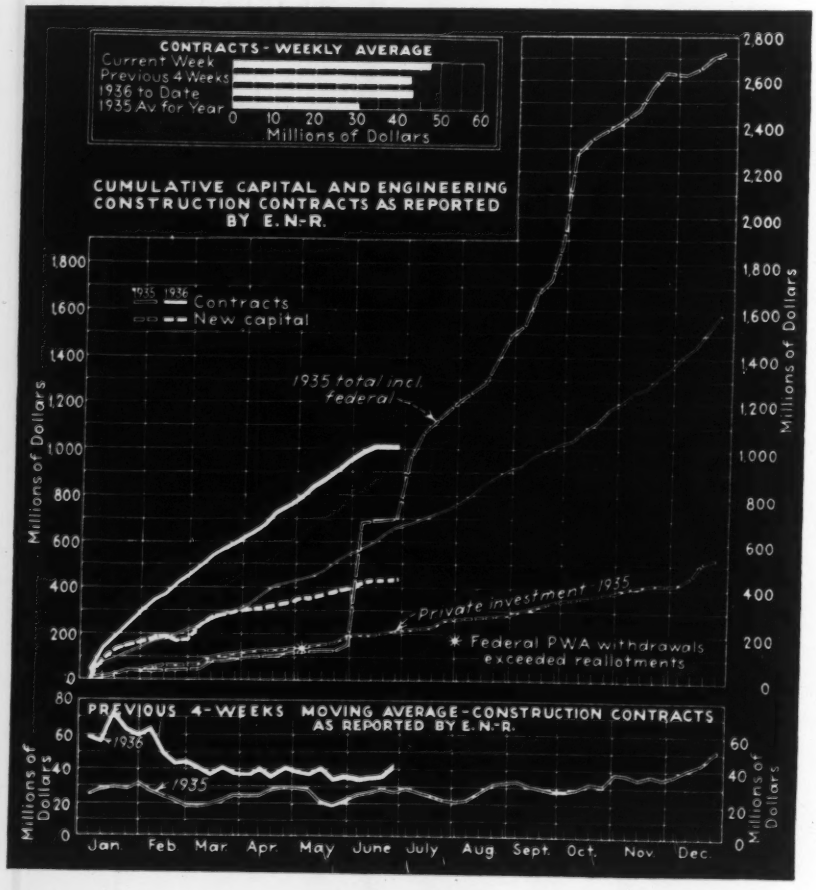
NEW PRODUCTIVE CAPITAL
(Thousands of Dollars)

1936	Week June 25	Cumulative
State and municipal	$9,053*	$274,255
PWA non-federal	—3,993*	32,190
RFC loans	....	12,008
Corporate issues	1,624	118,974
PWA loans, Private	....	3,270
Total Non-Federal	$6,684	$440,697
Federal	....	4,955
Total new capital	$6,684	$445,652
Cumulative to date:		
1935...$685,638,000	1936...$445,652,000	

Note: These figures include private bonds, and stocks sold for productive purposes; state and municipal bonds for construction; PWA loans and grants to states and municipalities, including the special highway funds; PWA private loans, and allotments for federal construction, deficiency act funds.

INDEX NUMBER

ENR Cost	1913 = 100	1926 = 100	ENR Volume	1913 = 100	1926 = 100
June, 1936	**204.60**	**93.35**	**May, 1936**	**149**	**65**
May, 1936	203.40	97.77	Apr., 1936	166	73
June, 1935	194.78	93.63	May, 1935	130	57
1935 (Av.)	195.22	93.84	1935 (Av.)	135	58
1934 (Av.)	198.10	95.23	1934 (Av.)	114	50
1933 (Av.)	170.18	81.80	1933 (Av.)	102	47


CONTRACTS - WEEKLY AVERAGE
Current Week
Previous 4 Weeks
1936 to Date
1935 Av for Year
0 10 20 30 40 50 60
Millions of Dollars
CUMULATIVE CAPITAL AND ENGINEERING CONSTRUCTION CONTRACTS AS REPORTED BY E.N.-R.
1935 1936
Contracts
New capital
1935 total incl. federal
Private investment 1935
* Federal PWA withdrawals exceeded reallotments
Millions of Dollars
PREVIOUS 4-WEEKS MOVING AVERAGE - CONSTRUCTION CONTRACTS AS REPORTED BY E.N.-R.
1936
1935
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

CONSTRUCTION REPORTS

WATERWORKS

PROPOSED WORK

Calif., North Sacramento—Chamber of Commerce Committee will investigate formation of joint district with Hagginwood for constructing water system. To exceed $25,000. Noted Aug. 14, C. D.—Aug. 22, E. N.-R.

Calif., Pittsburg—City Council making surveys to purchase water from Mokelumne system of East Bay Municipal Utility Dist., 512 16th St., Oakland, pending completion of Contra Costa Conduit. City Manager Denham and City Councilman Cardinalli have been asked by mayor to make special study of needs of city for filtration and chlorination plant. To exceed $25,000. Noted Dec. 18, C.D.-Dec. 26, E.N.-R.

Calif., Walnut Creek—City plans bond election to finance construction of water system, incl. 300,000 gal. storage tank, distributing mains and pumps. W.P.A. grant of $40,000 available July 15. Materials to be supplied by City estimated to cost $42,100. G. Oliver, city engr.

Ill., Anna—City plans water supply. P.W.A. project. Warren & Van Praag, Decatur, Ill., engrs.

Kan., Lenexa—City, R. J. Sims, clk., plans waterworks system, incl. 2 tanks on towers, pumping equipment, distribution mains, fire hydrants, etc. $67,300. $37,000 bonds voted several months ago. Maturity indefinite pending P.W.A. allotment. Shockley Eng. Co., 800 Graphic Arts Bldg., Kansas City, Mo., engrs. Noted Nov. 8, C. D.—Nov. 14, E. N.-R.

Kan., Pittsburg—City rejected bids June 16, constructing water softening plant, elevated steel wash water tank, filter equipment, furnishing, erecting auxiliary equipment, incl. boiler feed pump, forced draft fan, breeching, coal handling equipment, ash handling equipment, structural steel walkways, piping, valves and fittings, electrical wiring, moving existing boilers, pumps, compressors, painting. P.W.A. project. Noted June 12, C. D.

Mich., Kalamazoo—Kalamazoo City Comn., approved water system project, involving outlay of $154,529, consisting of installation of large watermains for less adequate lines and other improvements. W.P.A. project with City furnishing $81,110. Government furnishing $73,419. Noted Nov. 30, 1934, C. D.—Dec. 6, 1934, E. N.-R.

N. H., Hocksett—Town, E. Allen, chn. Bd. Selectmen, Town Hall, constructing water supply system. Est. about $90,000. **Maturity indefinite.**

N. Y., Brooklyn—New York Water Service Co., 90 Broad St., New York, plans 1 story water storage tank, steel, 3402 Foster Ave. $65,000. D. Salvati, c/o owner, engr.

N. Y., Hoosick Falls—Village plans constructing c.i. water pipe line across Hoosick River. To exceed $23,000. Solomon & Keis, 257 Bway., Troy, engrs.

N. C., Battleboro—Town plans application to P.W.A. for loan to finance construction waterworks and sewerage systems. $50,909.

N. C., Beauville—Town filed application with P.W.A. for loan and grant to finance construction of waterworks system. $32,727.

N. C., Everetts—Town, C. B. Riddick, mayor, file application with P.W.A. for loan and grant to finance construction waterworks and sewerage systems. $35,200.

N. C., Garner—Town filed application with P.W.A. for loan and grant to construct waterworks system. Est. $34,545. A. Jones, Garner, mayor.

N. C., Nashville—Town, D. W. Perry, mayor, filed application with P.W.A. for loan and grant to finance construction waterworks and sewerage systems. $58,181.

N. D., Langdon—City soon takes bids drilling well, about 1,600 ft. deep. $15,000. E. L. Lium, Grand Forks, engr.

N. D., Minot—City to seek W.P.A. funds to furnish, extend c. i. watermain in 4th Ave. to fair grounds. $32,000. L. G. Wilhelm, city engr.

Ore., Salem—Stevens & Koon, engrs., Spalding Bldg., Portland, in charge development new Salem water system, soon takes bids 100,000 gal. steel elevated tank, 70 ft. high, on Fairmount Hill to replace old tanks.

Pa., Dallas—Dallas Water Co. plans raising water supply tank in Parrish Heights section; constructing new supply reservoir and replacement of c.i. watermains in Church and Claude Sts., Dallas Twp. **Maturity late in 1936.**

Wyo., Sheridan—Town, c/o Clerk, soon takes bids constructing earthfill dam and concrete diversion dam, $68,500. Part of $700,000 P.W.A. municipal water system improvement project. D. J. McQuaid Eng. Service, 614 Cooper Bldg., Denver, Colo., engrs.

B. C., Dawson Creek — Municipality, J. N. Bond, secy., plans water supply from springs 4 mi. out of town and laying necessary distribution mains. $25,000. Noted May 14, C. D. —May 16, E. N.-R.

N. B., St. John—Municipality making plans 8,000 ft. water pipe line from Lake Latimer to Phinney's Hill.

Ont., Kirkland Lake — Teck Twp. making plans watermains and sewers. $56,000. F. G. Brown, engr.

Ont., Listowel—Municipality plans extension and improvement of water supply system. $30,000. E. D. Bolton, Listowel, engr.

Ont., Ridgeway—Municipality plans extension and improvement of water supply system. $35,000. M. Gray, Fort Erie, engr.

BIDS ASKED

★**Conn., Danbury**—July 2, by T. J. Bowen, secy. Danbury Waterworks Impvt. Comn., City Clerk's Office, City Hall, Contr. B, West Lake filter plant. P.W.A. project. Total est. $570,000. C. Everett, 22 East 40th St., New York, engr.

Idaho, McCall—W. E. Jordan, city clk., taking bids drilling 10 in. well on footage basis, casing to be furnished driller.

Md., Baltimore—July 1, by Bd. Awards, furnishing, erecting 4 m.g. steel tank on Melvin Ave. Reservoir. Bureau Water Supt., Municipal Bldg., engr.

Md., Havre de Grace—City bids about July 20, new water system. J. Spence Howard, 20 East Lexington St., Baltimore, engr.

N. Y., Chester—July 9, by Village, Municipal Bldg., constructing 500,000 gal. (30 ft. diam. x 100 ft.), steel water storage standpipe, concrete base; 2,400 lin.ft. 6 and 8 in. c.i. mains; valves, fittings, etc., for waterworks. $17,000. R. R. Shearer, 91 North Pearl St., Albany, engr. Noted May 8, C. D.—May 14, E. N.-R.

N. Y., Palatine Bridge — See "Contracts Awarded."

N. Y., Webster—July 3, by Village Bd., W. H. O'Dell, clk., furnishing c.i. pipe and castings for waterworks system $71,250; gate valves and boxes $2,655; hydrants $2,400; and constructing waterlines $33,480. Total $109,785. Meloy Smith, 16 State St., Rochester, engr.

Pa., Daisytown (Johnstown P. O.)—June 29, by Daisytown Borough, M. B. Lintner, secy., R.D. 2, Johnstown, pumping station, pipe lines, 500,000 gal. rein.-con. reservoir. $88,500. Noted May 13, C. D.—May 21, E. N.-R.

Pa., North East—See "Contracts Awarded."

Pa., Wyomissing—See "Contracts Awarded."

Tex., Dawson—July 1, by City, c/o W. P. Johnson, mayor, waterworks, incl. 1 earthen dam, appurtenances, extensions and improvements to water distribution system, incl. new pumphouse, new pumps, supply mains, fire hydrants, pole transmission line to pumphouse, water meters, etc. $58,000. P.W.A. project. A. F. Mitchell, Corsicana, engr. Noted June 15, C. D.—June 18, E. N.-R.

Tex., Mingus—July 8, by City, c/o L. Manti, mayor, water distribution system, sewers, incl. complete vitr. clay sewerage system, to heating plant. $83,000. P.W.A. project. Hawley, Freese, Nichols, 407 Capps Bldg., Ft. Worth, engrs. Noted Sept. 26, C. D.—Oct. 3, E. N.-R.

CONTRACTS AWARDED

★**Ark., Little Rock** — H. C. Graham, city clk., constructing Contr. 1, 32.4 mi. 39- to 43-in. water supply pipe line, concrete pipe, incl. accessories, structures, tunnel sections, from Alum Fork in Salem County to Little Rock, to Lock Joint Pipe Co., Ampere, N. J., $1,561,683. Award subject to P.W.A. approval. Bids June 16. Noted May 29, C. D.—June 4, E. N.-R.

Ill., Newman—City, D. Christ, clk., water softening plant for waterworks, to International Filter Co., 59 East Van Buren St., Chicago, $3,295. **P.W.A.** Bids Nov. 6. Noted Nov. 1, C. D.

Ill., Troy — City, completing water supply, supply main, booster pumping station, distribution mains, elevated storage tank, service meters, fire hydrants and valves, to P. N. Kruse Co., 77 West Washington St., Chicago, $92,970. **P.W.A.**

N. J., Sayreville—Council, 5,000 ft. 6 in. c.i. pipe, to Florence Pipe Fdry. & Machine Co., Florence, Class B $2,750 and Class C $3,250; 5,000 ft. transite pipe, to Johns Manville Co., 22 East 40th St., New York, $3,000 and $3,315. Grand total $12,315. Noted May 13, C. D.—May 21, E. N.-R.

N. Y., Palatine Bridge—Village, constructing large rein.-con. reservoir, own forces. To exceed $23,000. Wood, Rasbach & Forrest, Herkimer, engrs.

N. Y., Plattsburg—J. A. Muncie & Son, general contractors, plumbing and heating for filtration plant for City, to M. A. Hardy & Son, 16 Cornelia St.•••electrical work, to W. W. Gothburg, Dannemora•••millwork, glass and glazing, to A. Mason & Sons, Inc., Peru. **P.W.A.** Noted Dec. 30, C. D.—Jan. 2, E. N.-R.

N. Y., Utica—Consolidated Water Co., improving Golden Reservoir 4, on Pleasant St., to Bart J. Ruddy, 1147 Mohawk St. Est. $25,000.

O., Ashley—City, installing, furnishing watermains and pump for Ashley Waterworks, Contr. 2, to J. A. Hickey, Prospect-4th Bldg., Cleveland, $36,002 est. $39,304; furnishing, installing 100,000 gal. elevated steel tank, Contr. 3, to Chicago Bridge & Iron Co., 37 West Van Buren St., Chicago, Ill., $10,520 est. $10,500. Noted June 2, C. D.—June 11, E. N.-R.

Pa., North East — Borough, constructing earthen reservoir for water supply system, day labor. $10,000. W.P.A. project approved. **Maturity at once.** H. Amthor, Erie, engr. Noted Jan. 7, 1935, C. D.—Jan. 10, 1935, E. N.-R.

Pa., Wyomissing—Borough, linking dead ends in c.i. watermain distribution system throughout borough, day labor. $15,692. **W.P.A. Maturity at once.** Owner purchases materials. C. A. B. Zook, Lancaster, engr.

†**Wis., Milwaukee** — National Park Service, City Hall, to F. D. Phillips & Sons, Sturgeon Bay, 120 ft. drilling well, $7.50 per ft.; 50 ft. at $4.25 per ft.; 30 ft. at $2.88 per ft.; and 20 at $2.50 per ft.•••to Chadwick Mchy. Co., pump, 165. Bids June 12, awarded June 12.

SEWERAGE AND WASTE DISPOSAL

PROPOSED WORK

Calif., Newport Beach—City Council instructed R. L. Patterson, engr., City Hall, to prepare preliminary assessment report for the proposed sewage disposal plant on Santa Ana River. $200,000. Plans are now before the State Bd. of Health for approval.

Minn., Hibbing — Village plans sewage disposal plant at Kittsville, suburb of Hibbing. $37,000. C. Henry, Kittsville, engr.

†**Miss., Greenville** — U. S. Eng., Vicksburg, constructing outfall sewerage system, to Volz

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C. D. Construction Daily
E. N.-R. Engineering News-Record
Federal Government projects symbol †

◆

†*Federal Government*

For official proposal advertising see Searchlight Section

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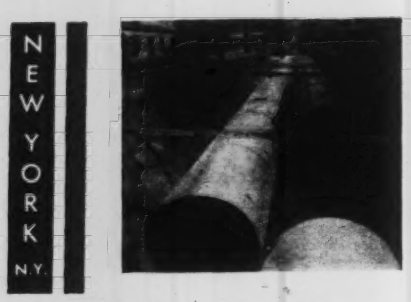

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Sewerage, etc. (Continued)

Constr. Co., Ripley, Tenn., $222,172. Bids June 2. Noted May 6, C. D.—May 14, E. N.-R.

Mo., Rock Hill—Village election June 30, $50,000 bonds, for constructing public sewer for various parts of village. W. C. Berry, 20 South Central Ave., Clayton, engr.

Mo., St. Louis—City, Bd. P. Service, City Hall, making plans constructing sanitary and storm water sewers, shafts, manholes, junctions, appurtenances, etc. for Sect. 3, Southern Arsenal Public Relief Sewers. $377,000. P.W.A. project. L. A. Pettus, city engr.

N. Y., Rochester—See "Contracts Awarded."

N. C., Everetts—See "Waterworks."

N. C., Hickory—Town, M. H. Yount, mayor, filed application with P.W.A. for loan and grant to finance construction sewage disposal plant. Est. $216,363.

N. C., Mars Hill — Town, J. E. Landers, mayor, filed application with P.W.A. for loan and grant to finance construction disposal plant. $50,000.

N. C., Nashville—See "Waterworks."

O., Cleveland—City plans 1 story, 60x120 ft., brick, steel, concrete building to house sludge tanks, filter bed and incinerator for Southerly Sewage Plant. $150,000. Noted Oct. 21, C. D. —Oct. 24, E. N.-R.

Ont., Kirkland Lake—See "Water Works."

Ont., London—City Council plans relief sewer in Mill St. $25,000. W. Veitch, city engr.

Ont., Port Arthur—City Engineer Flook preparing plans for Brent Park trunk sewerage system. $200,000.

BIDS ASKED

Mo., St. Louis—July 7, by Bd. P. Serv., City Hall, constructing in tunnel approximately 1,960 ft. sewer 12-in. to 72-in.x82-in. box type, and 900 lin.ft. sewer 60x60 in. diam. together with all necessary manholes, inlets, junction reducers, junction chambers and appurtenances, for Sect. 2-A, Southern Arsenal Public Relief Sewers. $83,500. P.W.A. project. L. A. Pettus, city engr.

N. Y., Brooklyn—July 1, by R. V. Ingersoll, pres. Brooklyn Boro. Boro Hall, constructing storm and sanitary sewers in Harway Ave., Avenues Z and Y, West 17th, Bay 49th and 50th Sts.; for Section 2, storm and sanitary sewers in West 11th St. between Avenues V and X.

N. Y., Yonkers—See "Contracts Awarded."

O., Cleveland—July 2, by City, 1 story, 60x 120 ft., brick, steel, concrete building to house sludge tanks, filter beds and incinerator, Westerly Sewage Plant. $150,000. G. B. Gascoigne, Leader Bldg., engr.

Wis., Milwaukee—July 2, by Sewerage Comn., 40 ton screenings incinerator; 2 power sewer cleaners, incl. cables and buckets. J. L. Fereber, Milwaukee, ch. engr.

Wis., Oshkosh—July 9, by City, sewage plant sewer, South side lateral sewer, North side lateral sewer, river crossing, intercepting structures, sewage treatment plant, pump station, plant and pumping station equipment. P.W.A. project. R. A. Cramer & Sons Co., 647 West Virginia Ave., Milwaukee.

CONTRACTS AWARDED

†**Calif., San Francisco** — Con. Q. M., Fort Mason, repairing sewers and drainage systems, to A. G. Raisch, 1 De Haro St., $4,885.

★ **Colo., Denver**—City, sewage disposal plant, incl. 2 story administration building, 3 story chemical building, 4 clarifier basins, 4 digestive basins and rectangular filter system, all buildings to be of concrete and especially processed tile to make plant entire odorless, to Peter Kiewit Sons Co., 1024 Omaha Natl. Bank Bldg., Omaha, Neb., $1,149,792, alternate B award, **P.W.A.** Bids June 10. Noted June 12, C. D.—June 18, E. N.-R.

Ill., Nashville—City, sanitary sewers in various streets, to H. A. Grabbe Constr. Co., Alton, $109,000. Bids Dec. 12. Noted Dec. 5, C. D.

Kan., Topeka—City, Sect. 2, sewers, P.W.A. 1266-R, to Brown Bros., Kansas City, $106,842. **P.W.A.** Bids June 12. Noted June 5, C. D.

Md., Baltimore—City, relining 150 ft. radial brick stack at No. 2 Incinerator, to Rust Eng. Co., Clark Bldg., Pittsburgh, Pa., $5,382. Noted June 18, C. D.—June 25, E. N.-R.

Md., Frederick—City, 60,000 lin.ft. 8- to 15-in. sewers and 44,000 lin.ft. house connections, to J. A. LaPorte, 11 West 42nd St., New York, $234,000. **P.W.A.** Noted June 10, C. D.—June 18, E. N.-R.

Mich., Muskegon — City, constructing substructure and building for disposal plant, to Muskegon Constr. Co., Muskegon, $90,000; Beach St. interceptor sewer connection and two pumping stations, to Fry & Kain, Lansing, $60,000. **P.W.A.** Bids June 4. Noted May 22, C. D.—May 28, E. N.-R.

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Mo., Kansas City—City, constructing Dist. Sewer 463, Div. 5, to Boyle-Proyer Constr., 226 West 39th St., $26,360. Noted Sept. C.D.—Oct. 3. E.N.-R.

Mo., St. Louis—City, constructing 2,070 ft. 72 in. sewer in tunnel manholes, shafts, ducers and appurtenances for Thirteenth S Relief Sewer, to Walsh & Wells, Inc., Sec Bldg., $84,749. Est. $107,000. **P.W.A.** June 9. Noted Apr. 29, C. D.—May 7, E. N.-R.

Neb., Peru—City, 34,107 lin.ft. 6- to 10- sewers, 55 manholes, 4 lamp holes, 8 flush tanks, 474 wyes, 100 ft. 36 in. corrug culvert pipe, 3,000 ft. ¾ in. galvanized pipe, etc., in various streets, to Young & H Maywood, $43,475. Est. $47,272. **P.W.A.** Bids Mar. 24. Noted Apr. 6, C. D.

N. Y., Rochester—City, sanitary and sto sewers in Palmer St., between Main and Br Sts., own forces. Est. about $25,000. **W.P.A. F. W. Carroll, engr. in charge.**

N. Y., Yonkers—City constructing 1,500 sewers in various streets, relief labor. $35,0 C. Sheridan, city engr. Owner will purch materials.

O., Cleveland—Industrial Rayon Corp., co structing 1,500 ft. 30- to 36-in. sewer encas in concrete from West 98th St. and Walfo Ave. to westerly sewage disposal plant. Carroccio & Gaudio, 2469 East 124th St. E $100,000. Noted Jan. 14, C. D.—Jan. E. N.-R.

O., Columbus—City, repaving over sto sewers in High St. Dist., Beechwold Branch Contr. 79, to Thompson-Conie Co., 795 Cossing ham Rd., $3,271. Est. $3,759. **P.W.A.** Bi June 2. Noted May 21, C. D.—May 28, E. N.-R

O., Wilmington—City, constructing 61,390 ft 6- to 15-in. vitr. sanitary sewers, 231 manholes, Constr. 3, to W. H. Crawford & Son Wilmington, $95,316. Est. $120,000 plus **P.W.A.** Noted Nov. 20, C. D.—Nov. 28, E. N.-R

Wis., Green Bay—Metropolitan Sewerage Comn., equipment, control pumping station and addition to sewage plant, Contr. D-1, clarifier equipment, to Dorr Co., 221 North LaSalle St., Chicago, Ill., $9,450***D-2, digester equipment, to Pacific Flush Tank Co., 4242 North Ravenswood Ave., Chicago, Ill., $10,538***D-3 chlorinator, to Wallace & Tiernan, 11 Mill Belleville Ave., Newark, N. J., $2,437***D-4, gas holder, to Chicago Bridge & Iron Co., 37 West Van Buren St., Chicago, Ill., $20,940***D-5, 2 sludge pumps, to Chain Belt Co., 1600 West Bruce St., Milwaukee, $1,132***D-6, pump motors and priming equipment, to Morris Machine Wks., 211 West Wacker Dr., Chicago, Ill., $7,275*** Contr. E, control pumping station, to J. C. Basten, Green Bay, $35,035***Contr. F, addition to sewage plant, to Hansen Bros. Co., 3148 West Chicago Ave., Chicago, Ill., $183,379. Grand total $270,186. J. C. Basten, general contractor for control pumping station, subcontracts, piping, to G. Reeke, Green Bay, $3,430 ***electrical work, to Kehl Electric Co., Green Bay, $7,367***masonry, to H. Bishop, Green Bay, $1,587***roofing, sheet metal to Northern Metal & Roofing Co., Green Bay, $202***structural steel, to Worden Allen Co., Pt. Washington Rd., Milwaukee, $290***ornamental iron, to A. F. Wagner Architectural Iron Wks., 1483 North Water St., Milwaukee***steel sash, to Federal Steel Sash Co., Waukesha, $1,096*** roofing tile, to Federal Cement Tile Co., 608 South Dearborn St., Chicago, Ill., $201***Hansen Bros. Co., general contractors for sewage plant, subcontracts, alum sash, to Federal Steel Sash Co., Waukesha, $3,957***glass and glazing, to Pittsburg Plate Glass Co., 820 North Market St., Milwaukee, $5,264***piping, heating, plumbing, to Johnson Bros. Heating Co., 1419 West Belle Plain Ave., Chicago, Ill., $30,625***structural steel, to Duffin Iron Wks., 37 West Vanburen St., Chicago, Ill., $3,615 ***sludge bed enclosure, to Foley Greenhouse Mfg. Co., Forest Park, Ill., $11,351***sludge digesterrotor, to Roger Fdry. & Mach. Co., Kingston, Pa., $730***shredder, to Chain Belt Co., 1600 West Bruce St., Milwaukee, $700. Bids May 29. Noted Mar. 13, C.D.—Mar. 19, E.N.-R.

Man., Winnipeg—Chairman Greater Winnipeg Sanitary Dist. Bd., erecting 5 regulator and overflow chambers, to Nelson River Constr. Corp., Winnipeg, $20,530***4 communitor and gate chambers, to Carter-Halls-Aldinger Co., Ltd., Winnipeg, $6,229***154,000 lb. reinforcing steel, and 12 pumping stations, to J. N. Pitts Co., Ltd., Winnipeg, $72,815. Grand total $108,044. Noted May 5, C. D.—May 7, E. N.-R.

Ont., Crawland—See "Materials and Equipment."

BRIDGES AND GRADE CROSSINGS

PROPOSED WORK

Calif., Courtland—Supervs. Yolo Co., Woodland, and Sacramento Co., Sacramento, will seek P.W.A. aid to finance construction of bridge over Sutter Slough, to replace present ferry. $25,000 or more.

Calif., San Francisco—Golden Gate Bridge & Highway Dist., 111 Sutter St., revised specifications being completed furnishing, installing ele-

†*Federal Government*

Bridges, etc. (Continued)

vator in each tower of Golden Gate Bridge. Noted Dec. 7, 1934, C. D.—Dec. 13, 1934, E. N.-R., under "Unclassified."

★**Florida**—Overseas Road & Toll Bridge Authority, c/o State Hy. Comn., Tallahassee, plans highway, incl. bridge structures from Lower Metacombe Key to Torch Key, Monroe Co.; bridge portion, rehabilitation of present railway structures over which Florida East Coast Railway Co. operated. P.W.A. allotment $3,000,000.

Iowa—State Hy. Comn., Ames, soon takes bids constructing 1 rein.-con. box culvert, 101x20 ft., multiple span bridge and grading 0.359 mi. secondary road between Sects. 9 and 10, Douglas Twp., Page Co., incl. 211 cu.yd. Class 1 and 84 cu.yd. Class 2 excav., 6,419 cu.yd. excav.; 2,815 cu.yd. channel excav.; 4 539 ft. viaduct continuous I-beam and girder deck type with approaches between retaining walls, roadways and sidewalks, Grand Ave., Sioux City, Woodbury Co.; 8,047 cu.yd. Class 1 and 840 cu.yd. Class 2 excav., 4,000 cu.yd. channel excav.; 9 corrugated metal pipe, 13 rein.-con. and 5 rein.-con. box culverts, 20 cu.yd. Class 1 excav., 120x20 ft. continuous I-beam bridge, incl. 20 cu.yd. Class 1, 70 cu.yd. Class 2 and 100 cu.yd. channel excav. on secondary road north from junction with Primary Rd. 3 on south line of Sect. 34, West Grove Twp., Davis Co.; 1 rein.-con. arch culvert and 236 ft. multiple span I-beam overhead on Primary Rd. 123, in Des Moines, Polk Co.; 1 rein.-con. pipe culvert; 125 ft. multiple span I-beam overhead bridge on same road. F. R. White, ch. engr.

Ia., Bedford—Taylor Co., T. L. Kuhn, aud., plans bridges and culverts on secondary roads. $25,080. S. R. Weir, co. engr.

Ia., Des Moines—Polk Co., E. S. Olmstead, aud., plans constructing bridges and culverts on secondary roads. $74,401. F. P. Laing, co. engr.

Ia., Waverly—Bremer Co., H. J. Stumme, aud., plans constructing bridges and culverts on secondary roads. $38,925. W. S. Chapman, co. engr.

Nev., Reno—City election Aug. 18, to vote bonds to finance construction bridge over Truckee River between Lake and Sinclair Sts., $113,500 of which State Hy. Dpt. provides $48,000. Bridge across river at Sierra St. $140,000.

New Jersey—State Legislature of New Jersey has authorized State Hy. Comn., Trenton, to enter into an agreement with Pennsylvania for constructing bridge across Delaware River near West Trenton.

New York—Dpt. P. Wks., State Bldg., Albany, plans constructing Bridges 10D, 10A, 10B, 10C and 11, Tompkins Co.; bridge near Callicoon, Sullivan Co. To exceed $46,000.

Ohio—State Hy. Dpt., Columbus, plans steel girder bridge on concrete piers, new steel truss single span 5 ft. clearance above water, to replace old center pier swing type bridge over Ottawa River. Permit applied for.

O., Cleveland—Bd. Co. Comrs. Cuyahoga Co., making plans widening east approach of Lorain-Carnegie Bridge. $50,000.

Pa., Versailles—Baltimore & Ohio R.R., Baltimore, Md., G. B. Farlow, ch. engr., B. and O. Station, Smithfield and Water Sts., Pittsburgh, plans 7 span steel bridge, over Youghiogheny River, 2 mi. above mouth of river.

South Carolina—State Hy. Dpt., Columbia, rejected bids May 19, 96 ft. combination bridge and 0.156 mi. earth type surfacing approaches under Southern R.R., W.P.G.S. 399, Union Co. Will readvertise. Noted May 27, C. D.—May 14, E. N.-R.

Texas—State Hy. Comn., H. Hines, chn., Austin, soon takes bids P. and S. F. R.R. underpass, approaches, drain facilities, etc., on Hy. 33, W.P.G.M. 959-A, Randall Co., $48,500. New P.W.A. project.

Vermont—State Hy. Dpt., Montpelier, H. E. Sargent, ch. engr., plans 3 span 225 ft. rein.-con., structural bridge.

★**B. C., Vancouver**—British Pacific Properties Ltd., 675 West Hastings St., plans and takes bids late this fall for 5,550 ft. 3 span and approach suspension bridge with concrete caissons, entrance to Vancouver Harbor. $6,000,000. Monsarrat & Pratley, Drummond Bldg., designing and supervising engrs. Robinson & Steinman, 117 Liberty St., New York, consult. engrs. (**Correction**—Engineers.) Noted June 8, C. D.—June 11, E. N.-R.

Que., Quebec City—Municipality making plans repairs to existing bridge, Dorvin Ave. $20,000. E. Hamel, City Hall, engr.

BIDS ASKED

Arkansas—June 30, by State Hy. Dpt., Little Rock, rein.-con., steel railroad underpass and topsoil gravel surfacing and concrete paving on Fulton Connection, Hempstead Co. $60,000. W. W. Zass, 316 Fern St., Little Rock, engr.

Arkansas—See "Streets and Roads."

Me., Brewer—See "Contracts Awarded."

†**Mass., Sagamore**—June 30, by U. S. Eng., Custom House, Boston, removing concrete bridge on North Bank of Cape Cod Canal, Spec. 175-36-86.

Ohio—See "Streets and Roads."

Pennsylvania—July 3, at office W. Van Dyke, secy. Hys., Harrisburg, through plate girder overpass, rein.-con. paving 48 ft. wide, one 10 ft. and two 7 ft. lanes of bituminous surface on Type "A" plain concrete base and two 10 ft. rein.-con. paved lanes on 227 ft. R-157, Sect. 13, Reading, Berks Co., involving 311 cu.yd. Class 1, 404 cu.yd. Class 2 and 553 cu. yd. borrow excav.; deck girder and rein.-con. I-beam bridge, rein.-con. paving 2,568 ft. R-521, Sect. R-521, Punxsutawney Borough, Jefferson Co., 1,540 cu.yd. Class 1, 1,141 cu.yd. Class 2 and 15,030 cu.yd. borrow excav.; temporary bridge and approaches having approximate overall length of 884 lin.ft. over Conemaugh River, 884 ft. hy. Appl. 965 and 694, Derry Twp., Blairsville Borough, Indiana and Westmoreland Counties.

CONTRACTS AWARDED

Alabama—State Hy. Comn., c/o G. Scott, pres., Montgomery, concrete, steel underpass and approaches 0.555 hy., Hasgood, W.P.G.S. 409, Colbert Co., to Mitchell Bros. Constr. Co., 3828 1st Ave. S., Birmingham, **$38,686.** Bids Jan. 31. Noted Feb. 10, C. D.

California—C. H. Purcell, state hy. engr., Los Angeles, constructing 3 rein.-con. bridges, overflow channel, on hy. over Warm Creek and Santa Ana River, San Bernardino Co., to Daley Corp., 4430 Boundary St., San Diego, **$128,365.** Bids June 4. Noted June 12, C. D.—May 28, E. N.-R.

Calif., Oakland—Supervs. Alameda Co., Bell Ranch Bridge over Alameda Creek in Decoto Washington Twp. on Decoto Rd., steel truss type, with 24 ft. roadway and two 4 ft. sidewalks, to W. J. Tobin, 3701 Balfour St., Oakland, **$39,830.** Est. $40,000. Bids June 9. Noted June 18, C. D.—May 28, E. N.-R.

Calif., San Francisco—Golden Gate Bridge & Highway Dist., 111 Sutter St., additional electrical work on Golden Gate Bridge, to Alta Electric & Mechanical Co., Inc., 467 O'Farrell St., approximately **$100,000** under revised specifications, contract changes include sodium vapor lighting and addition of complete substation equipment. The district plans to purchase power at 11,000 volts and operate an independent distributing system. Noted Nov. 10, 1932, E. N.-R.

Georgia—State Hy. Dpt., Atlanta, 1 bridge over Coolewahee River, Leary-Albany Rd., Dougherty Co., to Pettus Constr. Co., Montgomery, Ala., **$7,473*****bridge over Buckhead Creek and Chew Mill Creek, Miller-Midville Rd., Jenkins Co., to A. Lyons, Rogersville, Tenn., **$36,752*****bridge over Camp Creek, near Townlesboro State Project 852, Part 2, 1-A, Wrightsville-Irwinton Rd., Wilkinson Co., to R. G. Foster, Wadley, Ga., **$6,458.** Grand total $50,683. Bids June 5. Noted June 12, C. D.

Ill., Chicago—Comrs. P. Wks., City Hall, erecting temporary 167 ft. span steel swing bridge, S.B.I. 49-1313-C.S., to Overland Constr. Co., 205 West Wacker Dr., **$113,231.** Bids Dec. 12. Noted Dec. 18, C. D.—Dec. 5, E. N.-R.

Indiana—State Hy. Comn., Indianapolis, extending 2 bridges over Blue River, Henry Co., to J. C. Jarrett & Son, Lynn, **$37,674** est. $45,374***constructing 3 bridges in Warren Co., to Clark & Duvall, Flora, **$55,451** est. $76,660***2 bridges in Delaware Co., to J. A. Crosbie, Bluffton, **$93,952** est. $115,704. Grand total $187,086. Bids June 2. Noted June 8, C. D.—May 21, E. N.-R.

Indiana—State Hy. Dpt., Indianapolis, constructing 4 span 140 ft. bridge in Hendricks Co., to R. E. Garber & Co., Rochester, **$38,474.** Est. $45,514. Bids Apr. 28. Noted May 4, C. D.—Apr. 23, E. N.-R.

Indiana—State Hy. Comn., Indianapolis, constructing 2 bridges in Warren Co., to B. E. Curry Bldg. Corp., Bloomington, **$19,948.** Est. $25,027. Bids June 2. Noted June 8, C. D.—May 21, E. N.-R.

Iowa—State Hy. Comn., Ames, 130x24 ft. continuous overhead bridge in Benton Co. and 172x24 ft. bridge in Johnson Co., to G. W. Condon Co., Grain Exchange Bldg., Omaha, Neb., **$12,283** and **$18,474** respectively***37 ft. bridge in Fayette Co., to T. Fisko, Garber, **$8,772*****122x24 ft. continuous I-beam bridge in Franklin Co. and one 122x24 ft. continuous I-beam bridge in Hamilton Co., to Zitterell Mills Co., Webster City, **$12,887** and **$13,383** respectively***130x24 ft. continuous I-beam bridge in Franklin and Wright Counties, to E. A. Kramme Co., Inc., 2210 East 32nd St., Des Moines, **$12,481*****14 rein.-con. pipe and 3 rein.-con. box culverts in Guthrie Co., to Schroyer Constr. Co., Baxter, **$3,756*****120x24 ft. continuous I-beam bridge on same road, to Lundgren Reis Co., 125 College Ave., Des Moines, **$22,875*****130x24 ft. bridge in Hardin Co., to Welden Bros., Iowa Falls, **$11,799***** bridge in Henry Co., to C. W. Boltz, Indianola, **$11,959*****2 corrugated metal pipe culverts, 8

†*Federal Government*

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"KEEP GOING" WITH Snap-on

NOTHING STOPS THIS HEAVY-DUTY BOXOCKET WRENCH . . .

● Lay into it! . . . no wrench so safe, so powerful! Up to 62" leverage that breaks loose rusted-on or tight-locked nuts. Boxocket grips nut on all sides . . . can't slip off. Direct pull on wrench utilizes full muscular force. Needs only 30 degree arc movement as against 60 degree for open-end wrenches. Offset Boxockets clear adjacent bolt heads or other obstructions. Or use *straight* Boxocket for straight-away nut-turning.

46 Boxocket Wrench Heads (23 offset, 23 straight) and 6 handle lengths (15" to 42"). Boxocket shanks lock securely in their respective handles. Handles each accommodate several sizes and are quickly interchanged. Socket sizes: 15/16" to 3½".

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Gauges calibrated either for pressure per square inch, or total load.

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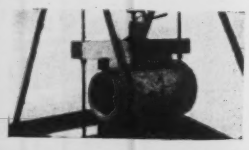

Blackhawk Hydraulic Jack Model D 11 G (12 ton) determining strength of concrete pipe.

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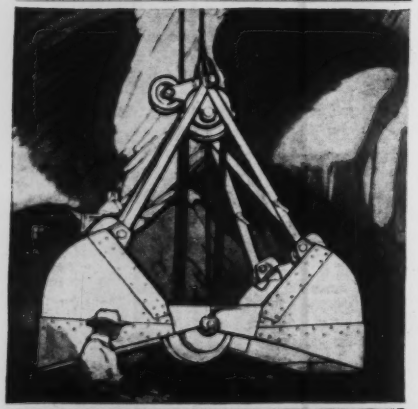
HYDRAULIC JACKS

ROPE-REEVE
POWER-WHEEL
LINK-TYPE
BUCKETS



Capacities: ½ to 15 Yards for All Kinds of Light or Heavy-duty Service.

INDUSTRIAL BROWNHOIST
BAY CITY, MICHIGAN
New York, Philadelphia, Cleveland, Chicago
Agents in principal cities

Bridges, etc. (Continued)

rein.-con. pipe culverts and extensions and 4 rein.-con. box culverts in Henry Co., to F. W. Guenther, Burlington, **$3,630*****30 ft. undergrade crossing in Humboldt Co., and 2 rein.-con. pipe culverts in Pottawattamie Co., to Snyder & Johnson, Inc., Humboldt, **$23,488** and **$2,250** respectively***2 rein.-con. pipe culverts in Madison Co., to F. E. Stoops, Ames, **$3,391** ***90x20 ft. pony truss bridge in Page Co., to Council Bluffs Constr. Co., Council Bluffs, **$9,768*****9 rein.-con. pipe and 6 rein.-con. box culverts in Pottawattamie Co., to M. L. Overman, Villisca, **$3,589*****12 rein.-con. pipe and 8 rein.-con. box culverts and extensions in Scott Co., to W. D. Phelan, Davenport, **$11,031.** Grand total $185,816. Bids June 9. Noted June 16, C. D.—June 4, E. N.-R.

Ia., Eldora—Hardin Co., constructing 160x20 ft. continuous I-beam bridge in Steamboat Rock, Hardin Co., to Welden Bros., Iowa Falls, **$23,980.** Bids June 11. Noted May 27, C. D.—June 4, E. N.-R.

Ia., Sioux City—Woodbury Co., W. H. Thompson, aud., constructing 191x20 ft. continuous I-beam bridge over Little Sioux River, to Graves Bros., Melvin, **$14,987*****eighteen I-beam bridges. Items 1, 3 and 4, to Haakinson Beaty Co., 1st and Nebraska Sts., Sioux City, **$7,244** ***Item 2, to Illinois Steel Bridge Co., Jacksonville, **$2,536.** Grand total $24,767. Bids May 28. Noted May 25, under "Materials and Equipment."

Maine—State Hy. Comn., L. D. Barrows, ch. engr., Augusta, Dickey Brook Bridge, Township 17, Range 5, P.W.A. Project 1014-23, to Walter V. Mitton, Inc., 12 Winter St., Augusta, **$10,462** ***Cedar Brook Bridge, Grafton Plantation, P.W.A. Project 1014-35, to Sweetser Bros., Yarmouth, **$7,111*****Meadow Brook Bridge, Howland, P.W.A. Project 1014-34, to E. Cyr, Waterville, **$9,349.** Grand total $26,922. Bids May 20, awarded June 9. Noted May 28, C. D. —May 14, E. N.-R.

Maine—State Hy. Comn., L. D. Barrows, ch. engr., Augusta, Barrett's Crossing over Bangor & Aroostook R.R., Caribou and Dyer Brook Crossing over Bangor & Aroostook R.R., to Bridge Constr. Co., Augusta, Me., and School St., Hazardville, Conn., **$57,431** and **$51,123** respectively. Bids June 3, awarded June 9. Noted June 9, C. D.

Me., Brewer—City, F. D. Farnsworth, mgr., City Hall, rebuilding rein.-con. bridge, day labor, $22,000-$25,000. Flood rebuild.

Minnesota — State Hy. Dpt., St. Paul, constructing Bridge 5584, 70 ft. deck plate girder underpass on St. Anthony Blvd., Project 27-002, Hennepin Co., to J. P. Haley Co., 1954 University Ave., St. Paul, **$25,538.** Bids May 15. Noted May 5, C. D.—May 14, E. N.-R.

Minnesota—State Hy. Dpt., St. Paul, constructing Bridge 5594, 80 ft. multiple beam span underpass and approaches, in Marshall St. N. E. WPGMS 594-A, Hennepin Co., to J. P. Haley Co., 1954 University Ave., St. Paul, **$68,719.** Bids May 15.

Minnesota — State Hy. Dpt., St. Paul, constructing Bridge 5568, 90 ft. truss span, 2 mi. west of Wilder, State Project 60-85-23-1C, Jackson Co., to Teberg & Berg, 1444 Portland Ave., St. Paul, **$32,678.** Bids June 5. Noted May 28, C. D.

Missouri—State Hy. Comn., Jefferson City, constructing two 10 ft. rein.-con. slab span bridge over Willow Branch and five 35 ft. I-beam span bridge over Salt River on Route 63-Willmathsville Rd., Adair Co., to C. H. Atkinson Paving Co., Chillicothe; two 45 ft. I-beam span bridge over Hinkson Creek, Boone Co., to F. T. O'Dell, Hannibal. Bids June 4. Noted June 15, C. D.

Nebraska—See "Streets and Roads."

North Carolina—State Hy. & P. Wks. Comn., Raleigh, structures on Route U. S. 52, Little Yadkin River toward Pilot Mountain, Project 7541, Surry and Stokes Counties, to Hobbs-Peabody Constr. Co., 317 West Worthington Ave., Charlotte, **$23,358.** Bids May 28. Noted June 4, C. D.

North Dakota—See "Streets and Roads."

★**Ohio—J. J. Jaster, dir. State Hy. Comn., Columbus**, constructing concrete bridge with steel beams, grading, drainage structures, cold mixed, cold laid tar concrete paving 0.099 mi. on Sect. D, Oak Harbor Genoa Western Rd., Ottawa Co., to J. W. Harper, Napoleon, **$16,465** est. $20,090***grading, draining, roadside improvements, constructing concrete slab bridge over Branch Buck Run, and constructing concrete slab bridge over Clear Fork, Hocking Co. to Beightler & Hussey, 297 South High St., Columbus, **$108,561** est. $125,283***constructing grade crossing elimination with B. & O. R. R. part Sect. A, Carthage Hamilton Rd., Butler Co. Proposal 1, and grading, drainage structures, roadside improvement, same road, Proposal 2, to Price Bros. and I. D. Tuttle Co. P. O. Box 825, Dayton, **$133,146*****constructing grade separation, with Penn. R.R. and C. & O. R.R. three railroad structures, Olentangy Blvd., Franklin Co., to O. Daniels Co., 135 South LaSalle St., Chicago, Ill., **$285,024.** Grand total $543,196. Bids June 9. Received no bids June 9, constructing new rein.-co[illegible] slab superstructure on existing stone abutme[illegible] over D. T. & I. R. R. on Fountain Ave., Cl[illegible] Co. $9,971. Noted June 2, C. D.—June 4, E. N.-R.

O., Hamilton—Comrs. Butler Co., constructing two 105 ft. steel truss span bridge [illegible] approaches abutments and pier over F[illegible] Creek, to R. F. Runck, 1st Natl. Bank [illegible] Cincinnati, **$14,678.** Est. $48,000. Noted May 19, C. D.—May 21, E. N.-R.

★**Texas**—G. Gilchrist, state hy. engr., Austin, St. L. and S. W. R.R. overpass and [illegible] way approaches Hy. 31, Smith Co. to [illegible] & Bertram, 112 West 9th St., Fort [illegible] **$225,413** est. $240,000***G. C. and S. F. R.R. and C.R.I. and G. R.R. overpass, Tarran[illegible] Co. to E. Lloyd, Box 1077, Fort Worth, $[illegible] est. $80,000***3 bridges on Hy. 44, Lee C[illegible] E. Artmann, Giddings, **$47,662** est. $5[illegible] Grand total $346,112. Bids June 2. [illegible] P.W.A. project. Noted June 8, C. D.

Texas—G. Gilchrist, state hy. engr., Austin, constructing T. and P. R.R. underpass [illegible] roadway approaches, Hy. 66, WPGS [illegible] Palo Pinto Co., to J. Floyd Malcolm & [illegible] Abilene, **$48,444** est. $50,000*** M. K. [illegible] T. R.R. underpass and roadway approaches and 4 span concrete girder bridge, Hy. [illegible] WPGH 488-C, Bastrop Co., to Cage Bros. and J. C. Ruby, Bishop, **$103,728** est. $110,000. Bids June 3. New P.W.A. project. Noted June 8, C. D.

★**Tex., Port Arthur**—State Hy. Comn., Austin, Contr. 2, superstructure Neches River Bridge over Neches River, on Hy. 87, between Beaumont and Port Arthur, Jefferson Co., P.W.A. Docket Texas 8080-R, to Taylor-Fichter Steel Constr. Co., 570 7th Ave., New York, **$1,613,000.** Est. $2,500,000. **P.W.A.** Bids June 10. Noted June 12, C. D.—June 18, E. N.-R.

Utah—See "Streets and Roads."

Vermont—State Hy. Dpt., H. E. Sargent, ch. engr., Montpelier, constructing 80 ft. span I-beam bridge with gravel approaches over First Branch of White River, Route 110, Chelsea Village, to Hayward & Noble, Tunbridge, **$13,226*****30 ft. span T-beam bridge with gravel approaches over Freeman Brook, on Route 100, Warren Village, to G. L. and E. L. Gregoire, Barre, **$5,763*****60 ft. span I-beam bridge with gravel approaches over Alder Meadow Brook on Route 100 and 60 ft. span I-beam bridge with gravel approaches over White River on Route 100, Granville, to H. J. Calkins, Dorr Dr., Rutland, **$22,607*****40 ft. span T-beam bridge with gravel approaches on Route 100, Plymouth, to H. D. Moore, Cole Ave., Williamstown, **$9,546.** Grand total $51,142. Bids May 15. Awarded May 28. Noted May 25, C. D.

Vermont and New Hampshire—State Hy. Dpts. of Vermont (Montpelier), and New Hampshire (Concord), constructing timber temporary bridge, replacing bridge damaged by flood, over Connecticut River, to Carlo Bianchi Co., Framingham, Mass. Est. exceeds $25,000. Soon takes bids on permanent bridge. Noted Apr. 7, C. D.—Apr. 9, E. N.-R.

Wisconsin—See "Streets and Roads."

Ont., New Hamburg—D. J. Emrey, engr. Waterloo Co., Court House, Kitchener, general contract constructing 136 ft., steel, concrete bridge over Nith River, to Martin & Brohman, Floradale, **$17,243;** structural steel, to Hamilton Bridge Co. Ltd., Bay St. N., Hamilton, **$12,000.** Noted May 5, C. D.

Que., St. Hyacinthe—Municipality, reconstructing 4 span rein.-con. bridge, to Dansereau Ltd., 300 Charlevoix St., Montreal, about **$35,000.** Est. $37,000. Noted May 25, C. D.—May 28, E. N.-R.

STREETS AND ROADS

BIDS ASKED

Ariz., Tucson—July 6, by H. O. Jaastad, mayor, City Hall, asphaltic concrete and cut back asphalt paving Wilson from Speedway to Elm and Elm from Campbell to Wilson. $35,063. P.W.A. project.

Arizona — July 7, by State Hy. Comn., Phoenix, concrete widening and asphaltic resurfacing existing pavement on East Van Buren St. extending from 16th St. to 24th St. W.P.M.H. 30, A.F.E. 8071, Phoenix-Tempe Hy.

Arkansas—June 30, by State Hy. Dpt., Little Rock, grading, drainage, 3 untreated timber bridges and traffic service gravel surfacing 7.4 mi. Arkansas-Louisiana Line on road through Burlin to 7 mi. south of Hamburg, Ashley Co. $49,000. W. W. Zass, 316 Fern St., Little Rock, engr.

Arkansas—June 30, by State Hy. Comn., D. Block, chn., Little Rock, grading, drainage structures, incl. 4 untreated timber bridges, traffic gravel surfacing 6.2 mi. Smith Chapel Rd., WPSO 414-A, Cross Co.; grading, minor drainage structures, rein.-con., steel railroad underpass and concrete paving 0.2 mi. North Little Rock-McAlmont Rd., Pulaski Co.; grading,

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†*Federal Government*

Streets and Roads (Continued)

drainage structures, concrete paving, traffic service gravel surfacing 4.5 mi. Stamps-Buckner Rd., Lafayette Co.; 203 ft. rein.-con. overpass over L. and A. R.R., at Stamps, WPGM 22, State Hy. 82, Sect. 2, Lafayette Co.; embankment, rein.-con. and steel overpass, concrete paving 0.21 mi. Jefferson St., Van Buren, Crawford Co.; grading, minor drainage structures, bituminous on bituminous base course surfacing 1.5 mi. Salem City Connection, Fulton Co.; structural steel bridge over North Fork of White River, Norfolk, WPGM 375-A, State Hy. 5, Sect. 8, Baxter Co.; grading, minor drainage structures, rein.-con. overpass, concrete paving 0.3 mi. Locust St., North Little Rock, Pulaski Co.; grading, minor drainage structures, traffic service gravel surfacing 6.5 mi. Norfolk Bridge approaches, Hy. WPMH 375-A, State Hy. 5, Sect. 3, Baxter Co.; grading, minor drainage structures, traffic service gravel surfacing 7.4 mi. Dumas-Winchester Rd., Desha and Drew Counties.

California—July 9, by C. H. Purcell, State Hy. Eng., Los Angeles, grading, imported select material and Class "B" seal coat surfacing 2 mi. 25th St., Palos Verdes Coast Highway to Patton Ave., Los Angeles Co., 84,900 cu.yd. earth excav.; grading, applying plant mix surfacing 3.6 mi. hy. Lake Hodges to Escondido, San Diego Co., 29,840 cu.yd. earth excav.; applying road mix surfacing 7.1 mi. hy. Palmdale to Lancaster, involving 7,500 cu.yd. mineral aggregate, 700 tons liquid asphalt, 108,500 sq.yd. asphalt paint binder, Los Angeles Co.; grading, applying liquid asphalt and construction of timber pile trestle 2.8 mi. hy., 2.3 mi. west of to ¼ mi. east of Java, San Bernardino Co., 56,295 cu.yd. earth excav. To exceed $92,000.

California—B. F. Lyle, secy. Lassen-Modoc Hy. Dist. 14, Court House, Susanville, taking bids grading, place culverts, constructing bridge and 2 cattle guards, cover 2.9 mi. hy. now graveled with binder material from earth borrow, on 6.7 mi. hy. between Susanville and Adin, Lassen Co.

Calif., Woodland — City Council soon takes bids improving Main St. between Elm and 2nd Sts., involving 40,702 sq.ft. grading, 40,702 sq.ft. gravel sub-base, 4 in. thick, 40,702 sq.ft. stabilized crusher run base, 4 in., 40,702 sq.ft. emulsified asphalt premix surfacing 2 in.

Colorado—July 1, by State Hy. Dpt., Denver, gravel surfacing 9.885 mi. hy. between Russell and the top of La Veta Pass on State Hy. 10, Anticipation Warrant Project 3006 Costilla Co., involving 76,000 cu.yd. earth excav. C. D. Vail, State Office Bldg., Denver, engr.

†**Colorado** — July 2, by Pub. Rds., Denver, Colo., grading, bituminous mix surfacing 7.524 mi. Project 26-F1, G1, of South St. Vrain Forest Hy., Larimer Co.; and 14.793 mi. Project 26-H-1, South St. Vrain Forest Hy., Boulder Co. J. A. Elliott, dist. engr.

Colorado—July 3, by State Hy. Dpt., Denver, gravel surfacing hy. northerly from Granite on State Hy. 4, Anticipation Warrant Project 5003, Chaffee and Lake Counties, 89,000 cu. yd. unclassified excav. C. D. Vail, State Office Bldg., Denver, engr.

Idaho—July 2, by Comn. Pub. Wks., Boise, roadbed, drainage structures, screened gravel subbase, crushed gravel surfacing and shoulders 0.286 mi. Yellowstone Park Hy. at Deadman's Curve North Idaho Falls, Bonneville Co., incl. 2,800 cu.yd. common excav.; 5.203 mi. Moscow-Bovill Hy. between Moscow and Joel, Latah Co., 100,000 cu.yd. unclassified excav.

†**Idaho**—July 2, by Bureau Reclamation, Ashton, construction of relocated roads at Island Park Reservoir, Upper Snake River Project, incl. 8,100 cu.yd. excav. R. F. Walter, Denver, Colo., engr.

Kansas—July 2, by State Hy. Comn., at office County Clerk, Mankato, bituminous material surfacing 13.766 mi. hys. in Cloud and Jewell Counties.

Kansas—July 3, by State Hy. Comn., at office of County Clerk, St. John, bituminous material, sand gravel for cover material surfacing, limestone for cover material surfacing 37.724 mi. hys. in Stafford, Barton, Kiowa, Reno and Butler Counties.

Maryland—June 30, by State Roads Comn., concrete paving 1.65 mi. hy., Contr. B-331-1-41, Baltimore Co.; 0.6 mi. at approaches to grade elimination at Dorsey, Contr. AA-74-2-321, HO-161-1-321, Anne Arundel and Howard Counties.

†**Mass., Buzzards Bay** (Bourne P. O.)—July 1, by U. S. Eng., Custom House, Boston, bituminous macadam paving roadways, at U. S. Engineers sub-office, Cape Cod Canal.

Mass., Middleboro—See "Contracts Awarded."

Mo., Kansas City—See "Contracts Awarded."

Mo., St. Louis—See "Contracts Awarded."

Mo., St. Louis—July 7, by Bd. P. Service, grading, rein.-con. paving North Florissant Ave. $132,060. P.W.A. project. L. A. Pettus, city engr.

†*Federal Government*

N. J., New Brunswick—July 2, by Freeholders Middlesex Co., resurfacing Livingston Ave., New Brunswick, Smith St. and New Brunswick Ave., Perth Amboy, Main St., Metuchen, 7,670 tons FABC 1.

N. Y., Brooklyn—July 1, by R. V. Ingersoll, pres. Brooklyn Boro, Boro Hall, grading, granite block paving Skillman St., Meeker and 3rd Aves.; asphalt on concrete repaving Lincoln, Sidney and St. James Pls., Herkimer, Covert and 62nd Sts.; asphalt block on concrete paving 83rd St.

N. Y., Buffalo—July 2, by P. Wks. Dpt., City Hall, repaving Greenwood Pl., Mystic, Ogden and California Sts., Sweet and Dewey Aves. G. J. Summers, comr.

N. Y., Jamestown—See "Contracts Awarded."

N. Y., Johnson City — See "Contracts Awarded."

N. Y., Newburgh—See "Contracts Awarded."

Ohio—June 26, by J. J. Jaster, Jr., dir. State Hy. Comn., Columbus, grading, drainage structures, traffic bound paving 3.338 mi. County Rd. 66, Wayne Co., $25,347; 3.526 mi. Buchanan Nipgen Rd., County Hy. 31, Pike Co., $13,710; 0.801 mi. Sects. A and B, County Hy. 535, $2,920; 1.657 mi. Sect. Z, part Sect. AA, County Hy. 22, $8,100; 1.798 mi. Sect. A, part Sect. B, County Hy. 325, $9,813, all foregoing Ashtabula Co.; 4.052 mi. Pence Larrick Rd., County Hys. 206-A, 207-A, 208-A, 221-A, 222-A, 224-A, Highland Co., $21,727; 2.001 mi. Cooper Foster Park Rd., County Hy. 33, Lorain Co., $17,194; 2.506 mi. Galbreath Rd. Twp. Hy. 160 B-C-D, Mercer Co., $15,002; 2.228 mi. part Sect. G, County Hy. 59, Portage Co., $8,162; grading, 2.942 mi. Brandeberry Rd., County Hy. 33-A, Wood Co., $12,475; grading, drainage structure, stabilized paving 2.193 mi. Vanderbelt Rd., County Hys. 328 and 323, Richland Co., $19,88; grading, drainage structures, cold mixed, cold laid tar concrete paving 0.204 mi. part Napoleon Sect., Toledo Napoleon Rd., State Hy. 457, State Route 33, U. S. Routes 6 and 24, Proposal 1, $19,795; and 0.574 mi. Napoleon Sect., Holgate Kiefersville Rd., State Hy. 32, State Route 33, Proposal 2, $22,767, both Henry Co.; grading, drainage structures, brick paving, constructing bridge on continuous I-beams over Ottawa River and roadside improvement 0.882 mi. on LaGrange St., Lucas Co., $195,092; grading, draining, rein.-con. paving 0.511 mi. and constructing grade crossing elimination highway structure over B. & O. R.R. on Sect. R, National Rd., State Hy. 1, U. S. Routes 22 and 40, Proposal 1, $124,443; and grading, drainage structures, rein.-con. paving, roadside improvement 1.287 mi. part Sect. Q and part Sect. R, same road, Proposal 2, $161,324, both Muskingum Co.

Ohio—J. J. Jaster, dir. State Hy. Comn., Columbus, received no bids June 9, grading, drainage structures, traffic bound paving 3.338 mi. Wayne Co., $25,347; 0.801 mi. Ashtabula Co., $2,920; 1.657 mi. Ashtabula Co., $8,100; 4.504 mi. Morrow Co., $21,977; 3.941 mi. Huron Co., $19,493; 2.228 mi. Portage Co., $8,162; 3.526 mi. Pike Co., $13,710; 1.798 mi. Ashtabula Co., $9,813; 2.942 mi. Wood Co., $12,475; grading, drainage structures, stabilized material paving 2.193 mi. Richland Co., $19,888. Noted May 26 and June 2, C. D.—June 4 and 11, E. N.-R.

O., Alliance—See "Contracts Awarded."

Pa., California—See "Contracts Awarded."

Utah—July 2, by State Road Comn., Salt Lake City, asphaltic treated road surfacing 4.881 mi. state hy. from Garden City to Idaho State Line, Rich Co.; grading, draining 4.952 mi. State Hy. between Eureka and Dumbar, Juab Co., incl. 66,000 cu.yd. unclassified excav.

†**Washington**—July 2, by Pub. Rds., Portland, Ore., grading Republic Kettle Falls (West Side) in Colville Natl. Forest, Ferry Co., incl. 75,200 cu. yd. unclassified excav.

N. B., Campbellton—See "Contracts Awarded."

Newfoundland, St. John — See Contracts Awarded."

Ont., Cornwall—See "Contracts Awarded."

Ont., Niagara Falls — See "Contracts Awarded."

Ont., Ottawa—Secretary Federal Dist. Com., Ottawa Electric Bldg., Sparks St., taking bids 1½ mi. addition to driveway which will run through Central Experimental Farm. $187,000. A. Hay, Ottawa, engr.

CONTRACTS AWARDED

California—C. H. Purcell, ch. engr., Los Angeles, grading, asphaltic plant mix surfacing 2.4 mi. hy. Beaumont to San Bernardino Co. Line, Riverside Co., and grading, concrete and asphaltic concrete paving 1.3 mi. hy. Colton to Waterman Ave., San Bernardino Co., to Oswald Bros., 366 East 58th St., Los Angeles, **$65,160** and **$71,273** respectively***grading, concrete paving 0.6 mi. Walnut Canyon Rd., Los Angeles Co., to C. F. Robbins, 602 Fairmount St., Glendale, **$50,716.** Grand total $187,149. Bids June 4. Noted June 12, C. D.

†**California**—Pub. Rds., Federal Bldg., San Francisco, bituminous treating 25.783 mi. Sects. F and G, portions of Sects. A, B, C, D and E.

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BETTER PERFORMANCE ON THE JOB!

"BOSS" HOSE COUPLINGS

Used for steam hose, steam hammers, air hydraulic or road builders hose . . . "Boss" Couplings have no equal for dependability in service. Parts are of steel or malleable iron to withstand abuse . . . Cadmium Plated for rust-proofing.

Furnished in Washer or Ground Joint Type.

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Designed and built to withstand the continual vibration of hand hammers and rock drills, this Dixon coupling has a longer, consistently economical service life on the toughest job. And, like the "Boss," it is rust-proofed by Cadmium Plating.

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- Capacity to 1000 Tons a Day,
- Lays Hot or Cold Bituminous, Stone or Macadam,
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Who, for over 40 years, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Bucket Loaders—Clamshell Buckets

(Streets and Roads (Continued)

of Route 21, Deer Creek Meadows Natl. Forest Hy., Butte and Tehema Counties, to L. J. Immel, 1031 Evelyn Ave., Berkeley, **$9,947.** Est. $11,440. Bids June 11. Noted May 29, C. D.

†California—Pub. Rds., 461 Market St., San Francisco, bituminous treating 5.722 mi. road in Shasta Co., to C. F. Fredericksen, Lower Lake, **$3,855.** Est. $4,695. Bids May 14.

Calif., San Rafael—Supervs. Marin Co., liquid asphalt SC-2 treating 2.6 mi. Marshall-Petaluma Valley Rd., 7.1 mi. Chileno Valley Rd., involving 225 tons liquid asphalt, to F. E. Crews, Fairfax, Calif., $11.24 per ton. Bids June 8. Noted June 18, C. D.

Colorado—State Hy. Dept., Denver, gravel surfacing 4.602 mi. hy. between South Fork and Del Norte on Rd. 10, F.A.P. 243F, Rio Grande Co., to Driscoll Constr. Co., Pueblo, **$65,074.** Bids June 3, awarded June 8. Noted June 8, C. D.—May 28, E. N.-R.

Georgia—State Hy. Bd., Atlanta, paving 9.072 mi. Louisville-Waynesboro Rd., Jefferson and Burke Counties, to Hardaway Constr. Co. 15 11th St., Columbus, **$47,608*****7.012 mi. Fairmount-Chattsworth Rd., Gordon Co., to Claussen-Lawrence Co., 1394 Gwinnett St., Augusta, **$138,319*****5.784 mi. Leary-Albany Rd., Dougherty Co., to W. L. Cobb Constr. Co., Decatur, **$44,346*****5.291 mi. Oglethorpe-Rupert Rd., Taylor Co., to Ballenger Paving Co., Greenville, S. C., **$76,883*****1.514 mi. Sumter Co.-Ga. Southwestern College Rd., Sumter Co., to Gibson & Robinson, Donaldsonville, **$44,340***** grading 5.059 mi. Metter-Statesboro Rd., Candler Co., to F. M. Jones, Jesup, **$25,242.** Grand total $376,738. Bids June 5. Noted June 12, C. D.

Ill., Belleville—Dpt. P. Wks. & Buildings, Div. Hys., furnishing, applying 645,826 gal. road oil, to East St. Louis Asphalt Sales Co., Spivey Bldg., East St. Louis, **$43,142.** Bids June 1. Noted May 27, C. D.

Ill., Chicago—Dpt. P. Wks. & Buildings, Div. Hys., bituminous surfacing 0.4972 mi. Sect. 001-0404, to Bartlett Hedges Constr. Co., 64 West Randolph St., Chicago, **$44,784***** 2.9816 mi. Sect. 005-0103-15d and 4.2185 mi. Sect. 203-0508-15d, near Richton Park to Leininger Constr. Co., 30 North La Salle St., Chicago, **$89,902** and **$111,908** respectively***1.0308 mi. Sect. 054-3232-15d, near Chicago, to Standard Paving Co., 1101 South Cicero St., $183,378; all foregoing work in Cook Co. Grand total $429,972. Bids May 19. Noted May 12, C. D.—May 14, E. N.-R.

Ill., East St. Louis—St. Clair Hy. Dpt., Court House, Belleville, grading, curbing, concrete paving 25th and 26th Sts., to Kelley Bros. Contg. Co., 4301 State St., **$26,410.** Bids June 1. Noted June 15, C. D.

Ill., Evanston—Dpt. P. Wks. & Buildings, Div. Hys., Springfield, bituminous concrete surfacing 1.0473 mi. Sect. 8-C.S., to Arcole Asphalt Co., 2555 South Ashland Ave., Chicago, **$24,119.** Bids June 1.

Ill., Rock Island—Dpt. P. Wks. & Buildings, Div. Hys., concrete paving 2.7513 mi. road near Wagner, Rock Island Co., to C. H. Schadt, Silvis, **$75,470.** Bids May 10. Noted May 12, C. D.—May 14, E. N.-R.

Ill., Waukegan—Dpt. P. Wks. & Buildings, Div. Hys., concrete paving 1.2313 mi. road in Lake Co., to Darrow & Barton, Waukegan, **$50,630.** Bids May 20.

Indiana—State Hy. Comn., Indianapolis, bituminous coated aggregate 8.13 mi. Marshall Co., to J. C. O'Connor & Sons, Inc., Fort Wayne, **$55,062.** Est. $65,713. Bids June 2. Noted June 8, C. D.—May 28, E. N.-R.

Indiana—State Hy. Comn., Indianapolis, rein.-con. and rock asphalt paving 2.326 mi. road in Henry Co., to Bigler Paving Co., Middletown, O., **$113,387.** Est. $147,104. Bids Apr. 7. Noted Apr. 13, C. D.—Mar. 19, E. N.-R.

Indiana—State Hy. Comn., Indianapolis, bituminous retread paving 1.087 mi. road in Crawford Co., to Hart & Hart, Columbus, **$49,918.** Est. $51,288. Bids June 2. Noted June 8, C. D.—May 28, E. N.-R.

Iowa—State Hy. Comn., Ames, to Schoenemann Clark Constr. Co., Sioux City, concrete paving 0.987 mi. roads in Carroll Co., **$26,626*****to Western Asphalt Paving Co., Sioux City, 0.535 mi. Emmet Co., **$17,675*****to Dzaboff & Wallis, Dubuque, grading 4.3 mi. Dubuque Co., **$24,091*****to J. W. Peed & Son, Fort Dodge, 5.661 mi. Guthrie Co., **$23,551*****to Burch Constr. Co., Cedar Rapids, 0.246 mi. Henry Co., **$3,965;** 5.23 mi. Scott Co., **$20,503;** 2.816 mi. Henry Co., **$13,637*****to Snyder & Johnson, Inc., Humboldt, 0.34 mi. Humboldt Co., **$12,398*****to F. O. Akin & F. Eblen, Corning, 3.804 mi. Pottawattamie Co., **$13,255*****to Iowa Road Building Co., 1495 Keo Way, Des Moines, bituminous surfacing 0.381 mi. Benton Co., **$1,060;** 10.711 mi. Carroll Co., **$27,083;** 4.984 mi. Greene Co., **$12,542;** 14.207 mi. Harrison, Pottawattamie and Shelby Counties, **$41,887;** 12.412 mi. Iowa Co., **$33,721;** 6.998 mi. Tama Co., **$17,570*****to Kaser Constr. Co., Adel, graveling 5.661 mi. Guthrie Co., **$7,881*****to Concrete Materials Corp., Waterloo, 6.331 mi. Keokuk Co., **$17,525*****to J. Schumacker, Bancroft, 3.783 mi. Mills Co., **$7,526*****to Baker & Patton, Cedar Rapids, 3.865 mi. Wapello Co., **$7,973;** 9.374 mi. Wapello Co., **$19,3**. Grand total $349,842. Bids June 9. No June 16, C. D.—June 4, E. N.-R.

Ia., Primghar—O'Brien Co., grading, drainage 21 mi. county roads, to L. J. Hartman Constr. Co., Laurens, **$23,448.** Bids June 1. Noted June 1, C. D.—June 4, E. N.-R.

Ia., Storm Lake—Buena Vista Co., W. H. Kaugman, aud., graveling road to Hartsell & Evans, Early. Bids June 10.

Ia., Vinton—Benton Co., improving road 29,801 cu. yd. resurfacing and 11,225 cu. yd. crushed rock surfacing, to B. L. Anderson, Toledo, **$57,588.** Bids June 12.

Kan., Kansas City—City, asphaltic concrete on rein.-con. paving 10 blocks Quindoro Blvd. from 17th to 27th Sts., to J. A. Tobin Const. Co., 3700 Rainbow Blvd. Est. **$160,000.** Noted May 14, C. D.—May 21, E. N.-R.

Kentucky—State Hy. Comn., Frankfort, high type surfacing, concrete paving 1.153 mi. Elizabethtown-Louisville Rd., NRH 79 B-S, Hardin Co., to Elis, Kelly & Co., Owensboro, **$27,990.** Bids June 12, awarded June 12. Noted June 3, C. D.

Kentucky—State Hy. Comn., Frankfort, grading, draining 2.164 mi. Inez-Louisa Rd., WPSO 431 AG, Martin Co., to Codell Constr. Co., Winchester, **$30,708.** Bids Apr. 17. Noted Apr. 23, C. D.—Apr. 9, E. N.-R.

Kentucky—State Hy. Comn., at office, Frankfort, rein.-con. paving 0.281 mi. F.A. 79-CS Hardin Co., to Ellis Kelly & Co., Owensboro, **$37,798.** Bids Aug. 9, Noted July 19, C. D.—July 25, E. N.-R.

Ky., Louisville—Dpt. P. Wks., R. W. Burks, dir., constructing parts of 13th St. from Hill St. to Magnolia Ave. and St. Louis Ave. from 12th to 13th Sts., to Andrews-Collings Asphalt Co., 13th St. and St. Louis Ave., **$19,526** and **$7,324** respectively***Spring Dr. from Bonny Castle Ave. to Cherokee Rd., to F. G. Breslin Co., 201 South 32nd St., **$19,951.** Grand total $46,801. **P.W.A.** Bids June 8. Noted June 2, C. D.

Maine—State Hy. Comn., L. D. Barrows, ch. engr., Augusta, bituminous macadam surfacing 0.48 mi. Project 139-E, Houlton, to Brewer Co., Presque Isle, emulsified asphalt, **$36,388***** gravel surfacing 3.59 mi. Project 147-B, Topsham, to Lane Constr. Co., 37 Colony St., Meriden, Conn., **$79,108*****0.92 mi. Project 148-F, Mexico, to Hagan-Thibodeau Constr. Co., Wolfeboro, N. H., **$24,858.** Grand total $130,354. Bids May 13, awarded June 9. Noted May 21, C. D.—May 7 E. N.-R.

Maine—State Hy. Comn., L. D. Barrows, ch. engr., Augusta, gravel surfacing 0.77 mi. Project WPH 299-A, Grand Isle, to Cyr & Soucy, Lille, **$18,585*****0.88 mi. Project WPMS 351, South Portland, and 1.27 mi. WPMS 349-B, Portland, to W. H. Hinman, Inc., North Anson, **$16,237** and **$35,029** respectively. Grand total $69,851. Bids May 20, awarded June 9. Noted May 29, C. D.

Maryland—State Roads Comn., Baltimore, macadam penetration on macadam paving 1.76 mi. along Churchville Level Rd., Contr. H-198-1-45, Harford Co., to T. B. Gatch & Son, 5937 Belair Rd., Baltimore, **$23,997;** stabilized earth surface course 3.34 mi. road from Wilsons Cross Roads to Penna State Line, Harford Co., to Ehrhardt & May, 5237 Harford Rd., Baltimore, **$55,980.**

Md., Baltimore—Bd. Awards, repairing sheet asphalt paving, Central Dist., to American Paving & Contg. Co., 2525 Loch Raven Blvd., **$63,492*****in Western Dist., to Baltimore Asphalt Block & Tile Co., 1320 North Monroe St., **$64,326*****Eastern Dist., to P. Flanigan & Sons, Harford Rd. and 25th St., **$62,680***** Northern Dist., to National Paving & Contg. Co., Menlo Dr. and W.M.R.R., **$62,156.** Grand total $252,654. Bids June 3.

Md., Baltimore—Bd. Awards, concrete paving 8,625 sq.yd. Contr. 667, to Mahoney Bros., 1111 Rutland Ave., **$21,993.** Noted June 18, C. D.—June 24, E. N.-R.

Mass., Middleboro—Town, H. J. Goodale, mgr., Town Hall, constructing bituminous concrete sidewalks, day labor. Est. $24,000.

Michigan—State Hy. Dpt., Lansing, grading, shaping street, drainage, concrete paving 0.337 mi. F82-35C-8, city of Detroit, Wayne Co., to Weir Constr. Co., 7338 Woodward St., Detroit, **$83,666*****vitr. brick and sheet asphalt paving 0.337 mi. F82-35-C-9, Wayne Co., to Detroit Asphalt Paving Co., 702 Transportation Bldg., Detroit, **$30,191*****preparing soil, furnishing and planting trees, shrubs and other plant materials, etc., 0.4 mi. F51-7C-5, Manistee Co., to Greening Nursery Co., Monroe, **$33,091***** gravel surfacing 3.671 mi. F.H. 35-21C-1, Iosco Co., to E. L. McQuiston, Leroy, **$29,481.** Grand total $176,429. Bids May 14. Noted May 25, C. D.

Minnesota—State Hy. Dpt., St. Paul, grading 7.1 mi. road between 6½ mi. southwest of Wheaton, State Project 27-190-22-1A and B, WPSS 479-B and WPMS 479-C, incl. 194,607 cu. yd. excav., to R. P. England & L. Shipman, Sleepy Eye, **$34,921,** 2.3 mi. S. P. 152-129-24, Fed. Aid Project 473-E, in Clearwater, 144,906 cu. yd. excav., to Strom Constr. Co., Moorhead, **$38,305.** Bids June 5. Noted May 27, C. D.

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†Federal Government

Streets and Roads (Continued)

Minn., Adrian—F. J. Forkenbrock, village recdr., grading, curbing, guttering, storm sewers, 8,900 sq.yd. rein.-con. paving to McKenzie Bros., 402 Baker Bldg., Minneapolis, **$31,305.** Noted June 2, C. D.

Missouri—State Hy. Dpt., Jefferson City, to C. W. Rose, Brookfield, grading, graveling 2.178 mi. Cherry Box-Route M Rd., **$9,056;** and 3.044 mi. Leonard Rd. West, **$6,245,** both Shelby Co. ***to Vaughn Constr. Co., Kirksville, 0.422 mi. road in Macon Co., **$425;** 0.872 mi. road in Boone Co., **$46,561*****to C. H. Atkinson Paving Co., Chillicothe, 2.102 mi. Sect. 2, Route 63-Willmathsville Rd., Adair Co., **$5,429;** 3.977 mi. Sect. 1, same road, **$37,758*****to Kissick Constr. Co., Hickman Mills, bituminous surfacing 10 mi. Lafayette Co., **$3,098;** 12.6 mi. Route 13-Blairstown Rd., Henry Co., **$6,910;** 3.2 mi. same road, **$1,757.** Grand total $117,-239. Bids June 4. Rejected bids June 4, improving roads in Benton and Cape Girardeau Counties. Noted June 12, C. D.

★ **Missouri**—State Hy. Comn., Jefferson City, to Kelly & Underwood, Granby, grading, concrete paving 1.18 mi. FAP 33C, Bolivar-Springfield Rd., **$41,684;** 3.768 mi. FAP 33-1, same road, **$121,515;** 4.696 mi. FAP 33-2, same road, **$156,268;** 4.798 mi. FAP 33-3, same road, **$159,621;** 2.175 mi. FAP 33B, same road, **$70,889*****to Deering & Davidson, Inc., 706 Chestnut St., St. Louis, 0.553 mi. Marion Co., **$71,601.** Grand total $621,568. Bids May 7. Noted May 15, C. D.

Mo., Kansas City—City, constructing 8 in. rein.-con. paving 1.5 mi. 14th St. from Bway. to Summit St., 55 ft., own forces. $450,000. R. L. Waddell, city engr.

Mo., St. Louis—City, Bd. Public Serv., City Hall, resurfacing approaches to vehicular highway deck of St. Louis Municipal Bridge across the Mississippi River between St. Louis, Mo. and East St. Louis, Ill., city forces. $25,000.

Nebraska — State Dpt. Roads & Irrigation, Lincoln, to Abel Constr. Co., Lincoln, asphaltic oil surfacing in Chase and Hayes Counties, **$2,451;** graveling 2.5 mi. Dakota Co., **$2,268;** asphalt oil surfacing Seward Co., **$2,236;** Gage Co., **$1,402;** Keith and Deuel Counties, **$2,964;** Harlan Co., **$4,620*****to Inland Constr. Co., 3867 Leavenworth St., Omaha, culverts in Chase Co., **$6,369;** aggregate on road in Morrill Co., **$765*****to Standard Oil Co., 504 South 18th St., Omaha, asphalt oil on road in Sioux and Dawes Counties, **$1,868;** in Morrill Co., **$4,659;** in Morrill Co., **$1,169;** in Morrill Co., **$978;** asphaltic oil, Custer Co., **$1,810*****to Hargrave Constr. Co., Cedar Rapids, Ia., stabilizing base surfacing 7.3 mi. road in Hitchcock and Red Willow Counties, **$46,769;** bituminous aggregate surfacing 4.4 mi. Antelope Co., **$19,-713;** 8.5 mi. Blaine Co., **$40,883;** 3.6 mi. Holt Co., **$18,328*****to Lyman-Richey Sand & Gravel Corp., 1119 Omaha Natl. Bank Bldg., Omaha, graveling 10.2 mi. Morrill Co., **$3,347;** aggregate on roads in Morrill Co., **$42;** in Custer Co., **$1,725;** in Seward Co., **$3,148;** in Keith and Deuel Counties, **$832*****to M. M. Liggett, Benedict, graveling 9.8 mi. Sheridan Co., **$9,120;** 13.3 mi. Hamilton Co., **$3,542;** 4.6 mi. Deuel Co., **$1,401;** 6 mi. Saunders Co., **$3,041;** maintenance graveling Saunders Co., **$385;** Saunders Co., **$2,706;** aggregate surfacing 4.4 mi. Antelope Co., **$3,792*****to Koppers Products Co., 110 East Wisconsin Ave., Milwaukee, Wis., tar on roads in Madison Co., **$6,939;** in Seward Co., **$4,502*****to Allen Davison Co., Beatrice, aggregate in Gage Co., **$918*****to W. B. Hall, Stratton, graveling 0.8 mi. in Red Willow and Frontier Counties, **$846*****to Nichols Constr. Co., Geneva, culverts in Furnas Co., **$4,144;** graveling 0.7 mi. Webster Co., **$307*****to Booth & Olson, Inc., Sioux City, Ia., grading, graveling and culverts in Burt Co., **$2,256*****to General Constr. Co., 933 Redick Tower, Omaha, bridge in Burt Co., **$14,603*****to Socony Vacuum Oil Corp., Federal Reserve Bldg., Kansas City, Mo., asphaltic oil in Brown and Cherry Counties, **$1,804*****to A. Einung, Nebraska City, graveling 0.8 mi. road in Franklin Co., **$452;** 2.7 mi. Harlan Co., **$1,593*****to Central Bridge & Constr. Co., Wahoo, grading 4.4 mi. Saunders Co., **$14,341;** culverts on same road, **$4,816;** bridge on same road, **$5,348*****to A. C. Ross, Bayard, grading 3.8 mi. Sioux Co., **$35,477*****to Platte Valley Constr. Co., Grand Island, culverts in Dawson Co., **$2,-576;** maintenance graveling Pierce and Knox Counties, **$2,164*****to Gerhold Matzen Co., Columbus, Boone and Madison Counties, **$4,782;** in Boone Co., **$7,166;** in Madison Co., **$762;** in Antelope and Boone Counties, **$5,147*****to Plainview Gravel Co., Plainview, in Madison and Pierce Counties, **$4,453;** in Knox Co., **$5,-080*****to J. N. Einung, Wayne, in Wayne and Dixon Counties, **$1,506;** in Stanton Co., **$3,192;** in Wayne Co., **$2,644*****to T. W. Gravel Co., Takamah, in Burt Co., **$1,610*****to I. S. Eager, Plattsmouth, in Saunders Co., **$578.** Grand total $332,719. Bids June 4.

Nevada—State Hy. Comn., Carson City constructing steel, concrete overpass on state hy. near Virginia City, Storey Co., to Nevada Rock & Sand Co., Reno, **$14,123** asphalic road mix surfacing 6.21 mi. state hy. between Logandale and 0.74 mi. South of Overton, Clark Co., to J. C. Compton, McMinnville, Ore., **$26,840.**

New Hampshire—State Hy. Dpt. Concord, 4 in. on 4 in. gravel surface course 1.041 mi. Brattle St., Webster, Merrimack Co., to Thomas W. Watkins & Son, Amesbury, Mass., **$6,070** est. $7,500***0.65 mi. Wilton Rd., Temple, Hillsboro Co., to A. H. Todd, Wilton, **$6,910** est. $7,500***3.067 mi. Mountain Rd., Malboro and Jaffrey, Cheshire Co., to R. H. Newell, Inc., Uxbridge, Mass., **$44,363** est. $45,000. Grand total $57,343. Bids May 28. Noted June 4, C. D.—May 21, E. N.-R.

N. Y., Jamestown—City, City Hall, cement, sidewalks, reconstructing broken walks, driveways, etc., own forces. $128,780. **W.P.A.** City will purchase materials. L. L. Graham, city engr.

N. Y., Johnson City — Village, curbing and guttering 17,500 ft. Riverside Dr., own forces. $25,000.

N. Y., Newburgh—City, City Hall, constructing Washington St., by relief labor. $38,400. **W.P.A.** Procurement Officer W.P.A., White Plains, will purchase materials. C. R. Woodhull, city engr.

North Carolina—State Hy. & P. Wks. Comn., Raleigh, grading, concrete paving 5.94 mi. Project 7541, Stokes and Surry Counties, to Stacey Bros. Co., Augusta, Ga., **$180,375.** Bids May 28, awarded June 16. Noted June 4, C. D.

★ **North Dakota**—State Hy. Comn., Bismarck, grading, etc. 6.298 mi. Inkster, E. N. & S. P. WPGM 131A, Grand Forks Co., to W. Collins, Fargo, **$20,103***** 4.185 mi. west of Bowbells, P. WPSO 457, Burke Co., to F. O. Smith, Steele, **$14,576***6.186 mi. west of Churchs Ferry, P. WPGH 27, Benson Co., to J. Coghlin, Rolla, **$42,026***grading, detour, etc. 3.703 mi. Surrey E. & W. P. WPGH 81, Ward Co., to W. H. Noel Co., Jamestown, **$20,590***grading, stabilized gravel surfacing, structure detour, 0.397 mi. west of Selz, P. WPGH 48C, Pierce Co., to C. L. Lindberg, Jamestown, **$33,087***grading, structure, 0.568 mi. west of Churchs Ferry, P. WPGH 27, Benson Co., to T. M. Swingen, Cooperstown, **$60,150***constructing underpass structure and approach, 0.227 mi. west of West Fargo, P. WPGS 605, Cass Co., to J. A. Jardine, Fargo, **$63,972***0.151 mi. West Fargo, P. WPGM 627, Cass Co., to Northern Impvt. Co., Fargo, **$64,754***0.201 mi. in Dickinson, P. WPGM 14C, Stark Co., to J. P. Haley & Young Connolly Constr. Co., St. Paul, Minn., **$189,694*****structural, 6.143 mi. Inkster, E. N. and S. P. WPGH 131A, Grand Forks Co., to Rue Constr. Co., Bismarck, **$14,304.** Grand total $523,256. Bids June 5. Rejected bids June 5, gravel surfacing 11.289 mi. Southwest of Mott, P. WPH 427A, Hettinger Co.; grading, etc., 3.678 mi. P. WPSO 590, WPMS 590, Mercer Co.; structural, 3.625, Hazen South, P. WPSO 590, Mercer Co. Noted June 11, C. D.—June 18, E. N.-R.

North Dakota—State Hy. Comn., Bismarck, to Westlie & Wilson, Minot, grading, gravel surfacing 8.99 mi. Karlsruhe northeast, P. WPSO 498, **$21,470;** 3.229 mi. State Route 14 West, P. WPSO 501, **$5,883;** 4.178 mi. South Berwick, P. WPSO 502, **$15,808;** 10.414 mi. east of Rangeley, P. WPSO 497, **$19,874,** all foregoing McHenry Co.***to A. Graff & Co., Bismarck, grading 4.003 mi. north of Carrington, P. WPGH 92, Foster Co., **$15,389;** 8.805 mi. Cando to Maza, P. WPGM 130, Towner Co. **$40,264*****to W. H. Noel Co., Jamestown, grading, structure, detour, etc., 6.918 mi. Medina west, P. WPH 306-CE, Stutsman Co., **$55,500;** grading 4.211 mi. south of Fergus, P. NRS 559, Grand Forks Co., **$12,486*****to L. Sloan, Minot, grading, detour, etc., 5.975 mi. Petersburg East, P. WPH 349A, Nelson Co. **$40,663*****to A. Campbell, Warwick, grading 5.132 mi. Carrington North, P. WPGH 2, Foster Co., **$22,-193*****to Northern Impvt. Co., Fargo, grading, detour, etc., 4.978 mi. Dawson to Tappen, P. WPH 306B, Kidder Co., **$31,695*****to Fargo Bridge & Iron Co., Fargo, structure 4.211 mi. Karlsruhe Northeast, P. WPSO 498, McHenry Co., **$6,000*****to T. M. Swingen & Son, Cooperstown, 4.211 mi. south of Fergus, P. NRS 559, Grand Forks Co., **$3,153.** Grand total $290,-378. Bids May 22. Rejected bids May 22, grading 11.912 mi. Amidon East, P. WPH 220CD, Slope Co.; grading, detour, etc., 9.721 mi. Tappen to Crystal Springs, P. WPH 54, WPH 306B, WPMH 306B, Kidder Co.; 5.569 mi. east of Bismarck, P. WPMH 174A, Burleigh Co.; structural 8.805 mi. Cando to Maza, P. WPGH 130, Towner Co.; 5.569 mi. east of Bismarck, P. WPMH 174, Burleigh Co. Noted May 8, C. D.—May 14, E. N.-R.

★ **Ohio**—J. J. Jaster, Jr., dir. State Hy. Comn., Columbus, grading, drainage structures, traffic bound macadam paving 3.22 mi. Crawford Co., to H. Candel, Bucyrus, **$19,189***3.128 mi. Vinton Co., to Merry & Cisler, Caldwell, **$19,-357*****2.215 mi. Wood Co., to C. M. Gray, Waterville, **$8,970*****2.45 mi. Ashland Co., to D. Tissling, 1010 East Mansfield St., Bucyrus, **$19,600***3.253 mi. Meigs Co., to C. A. Baker, R.D. 2, Cambridge, **$23,707***2.064 mi. Morgan Co., to W. J. Elliott, McConnellsville, **$21,-914***3.653 mi. Upper Fivemile Rd. and 3.39 mi. Cumberland Rd., both Brown Co., to C. E. Biehm, Georgetown, **$15,789** and **$13,204** respectively***1.251 mi. Auglaize Co., to Davis-Hydaker Co., Spencerville, **$5,302*****0.606 mi. Township Hy. 80-R, and 0.73 mi. Township Hy. N-125-F, both Mercer Co., to Rockford Stone Co., Rockford, **$2,763** and **$3,002** respectively***grading, drainage structures, bituminous surface treatment 2.907 mi. Fayette Co., to Andrews Asphalt Paving Co., Hamilton, **$24,-**

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†Federal Government

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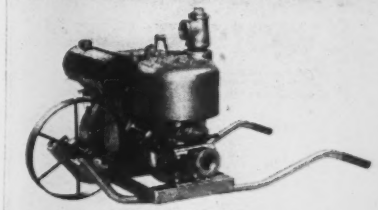

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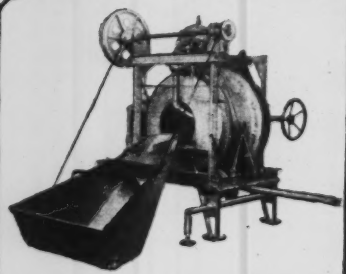

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Streets and Roads (Continued)

101***grading, drainage structures, waterbound macadam paving 2.596 mi. Sandusky Co., to Peerless Constr. Co., 4264 Croghan St., Fremont, **$20,357*****1.633 mi. Sandusky Co., to Mowry-Loos & Mowry, R.F.D. 3, Monroeville, **$11,903*****2.717 mi. Henry Co., to P. R. Creager, Inc., Liberty Center, **$21,922*****1.89 mi. Ottawa Co., to Weis Bros., Elmore, **$21,727*****brick paving 1.285 mi. Scioto Co., to L. T. Cisler & Son, P. O. Box 528, Marietta, **$107,528*****hot mixed, hot laid asphalt resurfacing 5.157 mi. Guernsey Co., to Tri-State Asphalt Corp., South Broadway, Martins Ferry, **$31,487*****bituminous macadam surface treating 5.037 mi. Stark Co., to E. Spring, Inc., New Philadelphia, **$19,143*****roadside improvement 0.453 mi. Franklin Co., to L. L. Snouffer, 2185 Fremont Rd., Columbus, **$10,220*****1.966 mi. Summit Co., to Kalley Bros. Co., Painesville, **$7,257.** Grand total $448,442. Bids June 9. Noted May 26 and June 2, C. D.—June 4 and 11, E. N.-R.

O., Alliance—City, WPA approved repaving Main St. through center of business district, day labor, under supervision City Eng. Dpt. $25,000. **Maturity at once.** City will purchase materials.

O., Dayton—Comrs. Montgomery Co., resurfacing 80 mi. black-top road with tar and gravel and applying black top surface 20 mi. untreated gravel road, to E. Kammer, 321 Northwestern Ave., **$84,335.** Est. $90,000.

Pa., California — Borough, draining, curbing various streets, to J. W. Butler, Walnut St., McKeesport, **$33,932.** Awarded subject to P.W.A. approval. Oliver & Whitted, Borough Bldg., engr.

Pa., Pittsburgh—See "Unclassified."

Texas—G. Gilchrist, state hy. engr., Austin, grading, several small drainage structures 8.617 mi. State Hy. 44, Lee and Milam Counties, to Cage Bros. and J. C. Ruby, Bishop, **$90,830** est. $100,000***iron ore top soil base course and road oil and asphalt surface treating 8.402 mi. State Hy. "F," Smith Co., to A. L. Mays, Jasper, **$33,896** est. $35,000***widening existing small drainage structures, base and surfacing 5.45 mi. State Hy. 15, Stephens Co., to J. B. Clardy Constr. Co., Fort Worth, **$34,077** est. $40,000***flood damage repairs, widening embankment, standard and H. E. S. concrete base course duraco pavement 0.365 mi. State Hy. 2, Travis Co., to Dodds & Wedegartner, San Benito, **$47,372** est. $50,000. Grand total $206,175. Bids June 2. New **P.W.A.** Noted June 8, C. D.

Texas—G. Gilchrist, state hy. engr., Austin, grading, drainage structures 6.035 mi. State Hy. 9, Glasscock Co., and triple asphalt on caliche surface treating 6.938 mi. State Hy. 27, Sutton Co., to Field Bros., Lubbock, **$94,306** and **$85,545** respectively. Est. $100,000 each. Bids June 2. Noted June 8, C. D.

Texas—G. Gilchrist, state hy. engr., Austin, grading, drainage structures, crusher run broken stone base course paving 4.276 mi. State Hy. 7, Coryell Co., to Cage Bros., Bishop, **$64,214** est. $70,000***grading, drainage structures and concrete paving 0.683 mi. State Hy. 15, Tarrant Co., to West Texas Constr. Co., 501 East Rosedale St., Fort Worth, **$49,924** est. $50,000. Bids June 3. Noted June 8, C. D.

Texas—G. Gilchrist, state hy. engr., Austin, grading, drainage structures 5.65 mi. State Hy. 1, Franklin Co., to J. S. Moore & Son, Lufkin, **$70,443** est. $75,000***grading, drainage structures, iron ore top soil base course and road oil and asphalt surface treating 8.74 mi. State Hy. "F," Cherokee Co., to H. Page, Norwood Bldg., Austin, **$48,702** est. $50,000***grading, drainage structures 7.105 mi. State Hy. 1, W.P.G.H. 27, Titus Co., to Earl Yates & Son, 1109 West Commerce St., Dallas, **$69,699** est. $80,000. Grand total $188,844. Bids June 3. New **P.W.A.** Noted June 8, C. D.

Utah—State Road Comn., Salt Lake City, grading, draining, roadbed gravel surfacing 1.2 mi. State Hy. between Holden and Kanosh, Millard Co., to L. A. Young Constr. Co., Richfield, **$15,085** est. $17,128; grading, draining, gravel roadway surfacing 1.5 mi. constructing wood and steel bridge 1.5 mi. state hy. between Junction and Kingston, Piute Co., to J. M. Sumsion, Springville, **$28,386** est. $30,286. Bids June 15. Noted June 3, C. D.

Wash., Everett — Comrs. Snohomish Co. road mix surfacing finished with seal coat 6.6 mi. Davies Rd., Lake Stevens-Machias OK mill road, Snohomish-I. O. O. F. cemetery road, and road mix type oiling 5.5 mi. Warm Beach-Norman and Granite Falls-Robe Roads, both Snohomish Co., to H. P. Dorsey, 2006 State St., Bellingham, **$23,518** and **$14,899** respectively.

Wash., Seattle—King Co. Comn., clearing 0.5 mi. and paving 0.5 mi. Marine View Dr., to L. J. Dowell, Inc., 1437 Elliott Ave. W. $29,615. Est. $28,000. Noted June 15, C. D.—June 18, E.N.-R.

Wisconsin—State Hy. Comn., Madison, crushed stone surfacing 2.28 mi. Vernon Co., to C. Weiss, 1646 Denton St., La Crosse, **$7,782*****6.173 mi. Juneau Co., to Interstate Constr. Co., Cobb, **$20,864*****15.6 mi. Outagamie Co., to E. J. Murphy, Route 2, Kaukauna, **$20,864*****grading, draining 2.28 mi. Vernon Co., to Nelson, Mullen & Nelson, Inc., 385 Gateway Bldg., Minneapolis, Minn., **$43,990*****constructing one 31 ft. I-beam concrete timber trestle span, Sauk Co., to G. Reynolds & Sons, Boscobel, $1,941***six 23 ft. I-beam concrete, timber [illegible] bridge, Buffalo Co., to E. Blank, Cochrane, $10,895. Grand total $109,345. Bids [illegible] Noted June 21, C. D.—June 18, E. N.-R.

Wis., Milwaukee—City, to N. Harris, $20 North Cass St., paving North 27th St. from West Burleigh to Hopkins Sts., **$51,3*****East and West North Ave. from Park [illegible] tion to North 8th St., **$109,650;** West [illegible] Ave. from North 8th to West Fond Du Lac Ave., **$111,903.** Grand total $272,901. Noted June 12, C. D.—June 18, E. N.-R.

†**Wyoming**—Pub. Rds., Denver, Colo., asphaltic road processing 37.304 mi. road in Yellowstone National Park, to Taggart Constr. Co., Cody, **$45,472;** 0.199 mi. structures and approaches on 3.718 mi. Tower Junction-Cooke City Hy., Yellowstone Natl. Park, to McLaughlin Constr. Co., Livingston, Mont., $39,552. Bids June 22. Noted May 29, C. D.—May 14, E. N.-R.

★**New Brunswick**—Dpt. P. Wks., Hys. Division, Fredericton, permanent paving [illegible] mi. from Aroostook Bridge to North of Grand River, Contr. 170, to Dexter Constr. Co. Ltd., Fairville, **$450,000*****17.5 mi. from Perth to Bath, 9 mi. from Florenceville to Hartland, 5 mi. from Andover to U. S. boundary, Contr. 171, to Dufferin Paving & Constr. Ltd., Fort St. and Bathurst, Toronto, Ont., **$390,000*****30.2 mi. from Allandale R.R. Crossing to McKinley Ferry, Contr. 172-A, to Currier Constr. Co., Fredericton, **$360,000*****32.5 mi. from Fredericton to Gagetown, Contr. 173, to McNamara Constr. Co. Ltd., 12 Industrial St., Leaside, Toronto, Ont., **$450,000*****23.6 mi. from Lake Side to Sussex, Contr. 174-A, to Storms Constr. Co. Ltd., 49 Givens St., Toronto, Ont., **$280,000*****8.7 mi. from College Bridge to Frosty Hollow, 19.5 mi. from Moncton to Barachois, Contrs. 176-G and 176-P, to Rayner Constr. Ltd., 29 Commercial St., Leaside, Toronto, Ont., **$475,000*****31 mi. from Aulac to Cape Tormentine, Contr. 177-A, to Storms Contg. Co. Ltd., 49 Givens St., Toronto, **$525,000*****27.1 mi. from Prince of Wales to Woodland Rd., Contr. 178, to H. J. O'Connell, O'Connell Ltd., 507 Canada Cement Bldg., Montreal, Que., **$290,000*****11.6 mi. from Campbellton to Metapedia, Contr. 179, and 24.8 mi. from Bathurst to Belledune River, Contr. 180, to Tomilson Constr. Co. Ltd., 503 Confederation Life Bldg., Winnipeg, **$124,000** and **$300,000** respectively***25.1 mi. from Chockpish Rd. to Gilberts Corner, Contr. 181, to Modern Paving (New Brunswick), Ltd., Fredericton, and 15.9 Sun Life Bldg., Montreal, Que., **$415,000*****56 mi. from Doaktown to Douglastown, Hy. 8, Contr. 182, to Canada Constr. Co. Ltd., Royal Bank Bldg., Fredericton, **$300,000*****33 mi. from Moncton to Albert, Hy. 14, Contr. 183, to B. H. Williamson, 1 Edward Ave., West Saint John, **$280,000*****grading 34.2 mi. from Penobsquis to Jones, Contr. 175-G, to J. H. Hay & Son, Woodstock, **$160,000;** paving same area, Contr. 175-P, to Rayner Constr. Ltd., 29 Commercial St., Leaside, Toronto, Ont., **$275,000.** Grand total $5,074,000.

N. B., Campbellton — Municipality, paving streets, day labor, $30,000. G. S. McDonald, St. Andrew, will purchase all materials.

Newfoundland, St. John—Dpt. P. Wks., Ottawa, Ont., constructing 50 mi. road between Grand Falls and Badger, and Deer Lake and Cornerbrooke, also 15 mi. retread in Avalon Peninsular, day labor. $75,000.

Ont., Cornwall—Stormont Co., graveling 5 mi. roads, surface treating 150 mi. roads, day labor. All materials will be purchased by J. G. Cameron, engr.

Ont., Niagara Falls—Niagara Parks Comn., paving 2 mi. from Upper Bridge to Whirlpool, also wall 3 ft. high from park entrance to Whirlpool along whole length of new road, day labor. Est. $190,000. In market for materials.

Ont., Port Arthur—City asphalt concrete paving streets, to Warren Bituminous Paving Co., Fleet St., Toronto, **$30,000.**

EARTHWORK, IRRIGATION, DRAINAGE AND WATERWAYS

PROPOSED WORK

Calif., Redwood City—City voted $200,000 bonds to supplement federal funds to finance deep water port at Redwood City, dredging, docks, etc. C. Dimmitt, city engr.

†**Florida**—U. S. Eng., Post Office, Jacksonville, postponed bids to have been opened July 2, constructing and removing obstructive land point at entrance and restoring jetties, at Lake Worth Inlet. Noted May 26, C. D.—June 4, E. N.-R.

†**Illinois**—U. S. Eng., 932 U. S. Post Office, Canal and Van Buren Sts., Chicago, indefinitely postponed taking bids to have been opened June 20, dredging Sect. 1, 1,413,000 cu. yd. and

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†*Federal Government*

Earthwork, etc. (Continued)

Sect. 2, 2,006,600 cu. yd. in Alton Pool. Noted June 1 C. D. June 4, E. N.-R.

†**Illinois**—U. S. Eng., Post Office Bldg., Chicago, indefinitely postponed bids to have been opened June 17, dredging between Miles 223.2 and 229.7, Peoria Pool. Noted May 27, C. D.—June 4, E. N.-R.

La., Lake Charles — E. G. Cormier, Lake Charles, plans dredging slip 25 ft. wide to have depth of 6 ft. below mean low water on 170 ft. south from Grand Lake Ridge Rd. Ferry, near Lake Charles, Cameron Parish.

La., Lake Charles—Magnolia Petroleum Co., Lake Charles, plans dredging 250 ft. slip on land side and 625 ft. long on channel side, 105 ft. bottom width, 10 ft. below mean low water depth on west bank of Louisiana and Texas Intracoastal Waterway, near here.

Mont., Helena — State Water Conservation Comn., preliminary plans constructing earth fill dam and canal system to irrigate 15,000 acres, near Medicine Lake, Sheridan Co. $476,000. P.W.A. project. F. E. Buck, Helena, engr.

★ **Nebraska**—State, Lincoln, survey for flood damage in Republican River valley, incl. bridges, dikes, roads, dikes and embankments. $500,000.

Neb., Elm Creek—Elm Creek Ditch Co. plans reconstructing ditches. $43,500 R.F.C. loan approved.

★ **N. Y., Brooklyn**—Dpt. Sanitary, 125 Worth St., New York, bids early in fall, constructing incinerator at Georgia Ave. $300,000; also preliminary plans incinerator at Bay St. $1,250,000. **Maturity on last job after Jan. 1.**

Tex., Beaumont—See "Unclassified."

★ **Tex., San Benito**—International Boundary Comn., San Benito, making plans strengthening levees, enlarging and strengthening flood levees, clearing and lowering floodways for flood prevention work in lower Rio Grande River. $1,600,000. Some work by day labor and some by contract.

Ont., Toronto—City of Toronto and Federal Dpt. Works, Ottawa, plan constructing breakwater on Toronto Island between Eastern Gap and Manitou Rd. $266,000.

BIDS ASKED

†**Calif., Richmond**—July 8, by U. S. Eng., Custom House, San Francisco, dredging 241,760 cu.yd. in Richmond Harbor.

†**Delaware**—June 29, by U. S. Eng., Phila., Pa., dredging 96,000 cu.yd. in Murderkill and St. Johns River.

†**Florida**—July 7, by U. S. Eng., Jacksonville, dredging 444,000 cu.yd. from Taylor Creek Navigation Channel.

★ †**Ill., Quincy**—July 21, by U. S. Eng., Rock Island, constructing Dam 21, in Mississippi River. Est. about $2,850,000.

★ †**Ia., Bellevue**—Aug. 4, by U. S. Eng., Rock Island, Ill., constructing Dam 12, in Mississippi River. Est. about $2,850,000.

Mass., Athol—Athol Mfg. Co., M. Alling, genl. mgr., 71 Chestnut Hill St., taking bids rebuilding 100 lin.ft. stone, concrete dam, construct spillway and waste gates, rebuilding and repairing remaining 200 lin.ft. present stone and concrete dam. Noted Apr. 22, C. D.—Apr. 30, E. N.-R.

†**Mass., Boston**—July 2, by U. S. Eng., Boston, grading, revetment, excavation and pipe culvert on north side Cape Cod Canal.

†**Mass., Boston**—July 10, by U. S. Eng., Boston, dredging 518,000 cu.yd. to provide channel in Weymouth River.

†**Mass., Weymouth**—July 10, by U. S. Eng., Wash., D. C., dredging 518,000 cu.yd. from Fore River, here.

†**Michigan**—July 7, by U. S. Eng., Duluth, Minn., dredging 4,009,000 cu.yd. at Upper Entrance and Canal, Keweenaw Waterway.

†**Mich., Keweenaw**—July 7, by U. S. Eng., Duluth, Minn., dredging 4,009,000 cu.yd. at upper entrance and Canal, Keweenaw Waterway.

†**Mich., Presque Isle**—July 14, by U. S. Eng., Duluth, Minn., dredging 380,000 cu.yd. from Presque Isle Harbor.

★ †**Mo., Saverton**—Aug. 18, by U. S. Eng., Rock Island, Ill., constructing Dam 22, in Mississippi River. Est. about $2,850,000.

LOW BIDDERS

★ †**Florida**—U. S. Eng., Jacksonville, June 16, constructing levee on North Shore Lake Okeechobee, from Willbank & Pierce, New Orleans, La., $1,058,610. Noted May 22, C. D.—May 28, E. N.-R.

CONTRACTS AWARDED

†**Conn., Hartford** — U. S. Eng., Providence, R. I., dredging 60,000 cu.yd. in Connecticut River, below Hartford, to J. S. Packard Dredging Co., 1 Court St., Boston, Mass., $17,800. Bids June 6. Noted June 15, C. D.—June 11, E. N.-R.

†*Federal Government*

Ia., Pocahontas—Pocahontas Co., R. A. Johnson, aud., about 8,580 cu.yd. drainage excavating in Dists. 65 and 72, to W. Heller, Fonda. Bids June 9. Noted June 5, C. D.

†**Mass., Gloucester**—U. S. Eng., Custom House, Boston, dredging 81,000 cu. yd. in Gloucester Harbor, to J. S. Packard Dredging Co., 1 Court St., Boston, $22,133. Bids June 10. Noted June 16, C. D.

Mass., Salem—Salem Electric Light Co., 89 Broad St., Boston, steel sheet pile bulkhead at South River Plant, to Seaboard Constr. Co., 201 Marginal St., Chelsea. F. W. Babb, 89 Broad St., Boston, engr.

†**Mass., Sandwich**—U. S. Eng., Custom House, Boston, steel sheet pile bulkhead on south side of Cape Cod Canal. Spec. 175-36-78, to T. E. McLaughlin, 48 Dell Ave., New London, Conn., $123,584. Bids June 5, awarded June 19. Noted June 9, C. D.—May 28, E. N.-R.

†**Michigan**—U. S. Eng., Federal Bldg., Milwaukee, Wis., dredging 48,000 cu. yd. from Grays Reef Passage to Great Lakes Dredge & Dock Co., 740 North Plankington Ave., Milwaukee, Wis., $91,200. Bids June 10. Noted June 22, C. D.—June 4, E. N.-R.

†**Mich., Detroit** — U. S. Eng., 605 Federal Bldg., constructing dike near Sugar Island, lower Detroit River, to J. T. Powpore, 1414 Grayton Ave., $47,671. Bids June 19. Noted June 10, C. D.

Neb., Genoa—Loup River Public Power & Irrigation Dist., to Morrison Knudsen, Boise, Idaho, constructing irrigation project, Schedule 1, $205,483 est. $278,300; Schedule 4, $39,476 est. $62,618; Schedule 5, $39,382 est. $52,165 •••to Chrisite Mills, Omaha, Schedule 6, $10,235 est. $15,750. Grand total $294,576. **P.W.A.** Bids June 4. Noted May 22, C. D.—May 28, E. N.-R.

†**N. Y., Buffalo**—U. S. Eng., Buffalo, dredging 18,000 cu.yd. in Buffalo River and Ship Canal, to Great Lakes Dredge & Dock Co., 34 Niagara St., $64,800. Bids June 2. Noted June 12, C. D.—June 7, E. N.-R.

†**O., Cleveland** — U. S. Eng., 541 Federal Bldg., Buffalo, N. Y., 290,000 cu.yd. dredging in Cuyahoga River, Cleveland Harbor, to Great Lakes Dredge & Dock Co., 213 Euclid Ave., $113,790. Bids June 5. Noted June 12, C. D.

†**O., Lorain** — U. S. Eng., Buffalo, N. Y., dredging 127,000 cu.yd. in entrance channel Lorain Harbor, to L. A. Wells Constr. Co., 1121 Schofield Bldg., Cleveland, $53,340. Bids June 2. Noted June 5, C. D.—May 28, E. N.-R.

†**South Carolina**—U. S. Eng., Custom House, Charlestown, dredging 500 ft. channel in Winyah Bay, to Standard Dredging Co., 80 Broad St., New York, $325,000. Bids June 9. Noted June 11, C. D.—May 28, E. N.-R.

†**Utah**—Bureau Reclamation, Custom House, Denver, Colo., 2 automatic radial gates and 1 gate float-well intake pipe for installation in spillway at Moon Lake Dam, Moon Lake Project, Spec. 789-D, Item 1, to Valley Iron Wks., Yakima, and Item 2, to Berkeley Steel Products Co., Berkeley, Calif. Bids May 20. Noted May 6, C. D.

†**Washington**—Bureau Reclamation, Yakima, constructing lower half of Tunnel No. 1, to Morrison-Knudsen Co., Boise, Idaho, $292,013. Bids May 28. Noted June 1, C. D.—May 14, E. N.-R.

★ †**Wash., Grays Harbor**—U. S. Eng., Seattle, completing jetty, to Columbia Constr. Co., Bonneville, Ore., $2,799,458. Est. $3,405,528. Bids June 4. Noted June 15, C. D.—May 28, E. N.-R.

Que., Ause a Beaufils—Dpt. P. Wks., Ottawa, Ont., reconstruction breakwater, to J. M. Babin & J. T. Langlois, Chandler, $13,272. Est. $20,000.

Que., Three Rivers—Dpt. P. Wks., Ottawa, Ont., dredging 57,929 cu. yd. sand and clay in harbor, to St. Francis River Dredging Co. Ltd., St. Francis du Lac, about $87,315.

FEDERAL POWER COMMISSION

Applications for Licenses and Permit Licenses

1374—H. L. Townsend, 1101 United States Natl. Bank Bldg., Denver, Colo., wants preliminary permit constructing power project on Lake Fork of Gunnison River, Hinsdale Co.

1375—G. W. Moore and R. D. Morris, Detroit, Ore., wants license power project on Tumble Creek, Marion Co., affecting lands in Willamette Natl. Forest.

1376—Montana Power Co., Butte, Mont., wants license constructing transmission line in Blaine Co., affecting lands in Fort Belknap Indian Reservation.

UNCLASSIFIED

PROPOSED WORK

Calif., Huntington Beach — PAVILION — Huntington Beach City Council, plans by Walker & Eisen, 708 Pacific Commerce Bldg., Los Angeles, 1 story, 112x120 ft. pavilion at end of municipal pier. $50,000.

Calif., Niland — PIPE LINE — National Dry Ice Corp., Niland, W. E. Morse, pres., made

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MANHEIM

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HIGHWAY MAINTENANCE NUMBER

July 30, 1936

HIGHWAY MAINTENANCE will be put into the limelight—

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By way of a series of articles which will treat the subject of Highway Maintenance from every angle. A veritable textbook on Highway Maintenance which will hold a place alongside the reference literature on highway construction and administration.

Engineering News-Record

Unclassified (Continued)

application to Imperial County Supervisors, Court House, El Centro, for franchise to lay a pipe line to transport carbon dioxide gas from wells in the north end district of Imperial Valley to dry ice plant at Niland. $23,000.

Ill., Blue Island — SWIMMING POOL — City plans constructing swimming pool. G. E. Larson, Inc., 5154 North Clark St., Chicago, engrs. Noted May 27, C. D.—June 4, E. N.-R.

Ill., Chicago—AIRPORT—City Engineer will propose at next meeting of City Council to remove tracks to enlarge Chicago Municipal airport from Harlem to Cicero Aves., and 55th to 63rd Sts.

★**Ill., Chicago**—RAIL LAYING—Chicago & North Western R. R. Co., C. T. Dike, ch. engr., 400 West Madison St., plans expending $3,000,000 for maintenance and $2,000,000 on maintenance of equipment than in 1935 in addition to laying 250 mi. new rail between Chicago and Omaha and reballasting 200 mi. between these two points. Total $5,000,000.

Ia., Glidden—TRANSMISSION LINES—Carroll Co., plans constructing 55 mi. rural electrification lines. $55,000 allotted.

Ia., Harlan—RURAL ELECTRIFICATION—Shelby County Rural Electric Co-operative, plans constructing 63 mi. (ultimately 250 mi.) electrification project, in Shelby, Harrison, Cass and Pottawatamie Counties. $67,500 allotted.

Ia., Muscatine—RURAL ELECTRIFICATION—Muscatine County Rural Electric Co-operative, Muscatine, plans constructing 69 mi. (ultimately 267 mi.) in Muscatine, Cedar, Louisiana and Johnson Counties. $70,000 preliminary allotment.

Ia., Renwick—RURAL ELECTRIFICATION—Boone Valley Electric Co-Operative plans power system in Wright, Humbolt and Hancock Counties to serve 118 customers. $45,000 loan offered by Rural Electrification Commission.

★**Mass., Salisbury**—BEACH DEVELOPMENT—Commonwealth of Massachusetts, Dpt. Conservation, 20 Somerset St., Boston, plans by F. H. Bond, Chamber of Commerce Bldg., Salisbury, beach development at Salisbury Beach Reservation, incl. 2 story, basement, bathhouses, 2 story, basement life guard station, 2 story, basement police barracks, power house, comfort stations, etc., concrete founds., brick, steel, timber construction. $1,000,000 or more. L. H. Haywood, Chamber of Commerce Bldg., engr. It is probable that owner will build by day labor under W.P.A. Materials will be purchased by Commonwealth of Massachusetts, Purch. Dpt., State House, Boston.

Minn., Triumph—RURAL ELECTRIFICATION—South Central Co-Operative Electric Assn., A. Edman, pres., applied for federal loan for rural electric distribution lines to serve consumers in four counties. $150,000.

Minn., Two Harbors—LIGHT and POWER SYSTEMS—Cooperative Light & Power Assn, Lake Co., T. Grinager of Two Harbors, and others, Inc., plans extension electric light and power systems through rural districts in Lake Co. current to be supplied by municipal power plant in Two Harbors. Rural Electrification Administration allotted $60,000 for same.

Minn., Virginia—RURAL ELECTRIFICATION—Northern Electric Co-Operative Assn., A. Neubauer, secy., applied for federal loan for 390 mi. rural electric distribution lines. $312,000.

†**Mo., Kansas City**—HANGAR—Con. Q.M., Leavenworth, Kan., making plans reconstructing 116x180 ft., steel, tile, sheet iron airplane hangar, destroyed by fire. $50,000.

Neb., Cedar Bluffs—TRANSMISSION LINES—Nebraska Power Co., 17th and Harney Sts., Omaha, plans reconstructing and raising voltage of rural transmission lines, near here. F. E. Smith, Omaha, c/o owner, engr.

Nev., Reno—SWIMMING POOL—City election Aug. 18, to vote bonds to finance construction of swimming pool in Idlewild Park. $75,000.

New York — ELEVATOR and SHELTER — Whiteface Mountain Comn., c/o Dpt. P. Wks., Albany, plans elevator in summit and constructing storm shelter in Whiteface Mountain. $150,000 appropriated.

N. Y., Elmhurst—BLEACHERS—Bd. Educ., 500 Park Ave., New York, plans by W. C. Martin, archt. and supt. School Buildings, Flatbush Ave. Extension and Concord St., Brooklyn, constructing bleachers for athletic field at Newtown High School, 56th Ave., 90th and 92nd Sts. Est. about $37,000.

N. Y., Jamestown—FOOTBALL FIELD, etc.—Bd. Educ., 4th and Springs Sts., Jamestown, plans rebuilding campus, at Senior High School, incl. new football field, athletic field, running track, jumping tracks, fencing entire campus, softball diamonds. $35,000. **P.W.A.** F. P. Rogers, secy.

N. Y., Jamestown—PARK—Bd. Educ., 4th and Spring Sts., plans constructing park, incl. grading, landscaping, etc., on property to be purchased opposite East 2nd St. $121,224. F. P. Rogers, secy.

N. Y., New York—BROADCASTING STATION—Columbia Broadcasting System, 485 Madison Ave., New York, plans constructing large broadcasting station, 58th St. and Park Ave. To exceed $50,000. Engineer and architect not appointed.

N. Y., New York—CONCESSION BUILDING, etc.—Dpt. Parks, Arsenal Bldg., Central Park, plans by A. Embury, 2nd, c/o owner, constructing concession building and park improvements, Crotona Park, Fulton Ave. and 171st St. $57,000.

N. Y., Randolph—GAS DEVELOPMENT—Commercial Gas Co., Rixford, Pa., plans developing potential natural gas area in Cattaraugus Co., south of here, incl. drilling several 4,800-5,000 ft. wells, each requiring 2,500 ft. or more 6¼ in. steel pipe. To exceed $23,000. **Maturity in July.** C. Reed, Randolph Hotel, engr.

North Carolina—RURAL ELECTRIFICATION LINES—Edgecombe Electric Membership Corp., W. C. Hargrove, chn. Bd., Tarboro, plans 35 mi. rural electrification lines to furnish Martin and Edgecombe Counties. $32,000. D. Bagley, State Rural Electrification, Raleigh.

O., Cleveland — GRANDSTAND — Cleveland Baseball Co., C. Slapnicke, genl. mgr., 1776 West 3rd St., plans 2 story grandstand addition, East 66th St. and Lexington Ave. $100,000. Osborn Eng. Co., 7016 Euclid Ave., engrs. and archts.

Okla., Oklahoma City—OIL PIPE LINE—Phillips Petroleum Co., Bartlesville, made preliminary plans constructing 17,000 lin.ft. 6 in. oil pipe line on Kelley Ave. $38,000. A. H. Riney, Bartlesville, engr.

Okla., Oklahoma City—PIPE LINE—Stanolind Pipe Line Co., Tulsa, made preliminary plans 6,600 lin.ft. 8 in. oil line on Glen Ellen St. $35,000. H. W. Webb, Tulsa, engr.

★**Tennessee and Georgia**—PIPE LINE—Southern Natural Gas Co., Birmingham, Ala., plans laying 70 mi. pipe line for natural gas, from Chattanooga, Tenn., to Cedartown, Ga. $1,000,000.

Tex., Beaumont—TERMINAL FACILITIES—Texas Co., Beaumont, plans surveys, etc., for port terminal facilities, incl. 144 ft. dock, 12 ft. wide, running into an "L" head of dimensions, 60 ft. long, 24 ft. wide, top of deck to be 8 ft. above water mean low tide, 30 x 75 ft. bathhouse; placing 11 nineteen pile clusters and dredging an area 250 x 1,300 ft., Port Neches, here. Application for permission to construct filed with U. S. Engineers. Lt. Col. E. H. Marks, dist. Federal Eng., c/o Trust Bldg., Galveston, consult. engr. Owners will use some company forces and also let some contracts (competitive) for the project.

Tex., San Antonio—CENOTAPH—City, State and Federal Government, plans constructing cenotaph a memorial to Heroes of Texas Independence, in Alamo Plaza, adjoining the Alamo. Total est. $250,000. W.P.A. project. Engineer, c/o Federal Texas Centennial Comn., Wash., D. C.

†**Va., Norfolk**—REPAIRING LIGHTS—Superintendent Lighthouses soon takes bids rebuilding and protection work for lighthouses, incl. depositing riprap in Potomac River and upper part of Chesapeake Bay; southern part of Chesapeake Bay and tributaries; building minor lights in Tangier and Pocomoke Sounds, and Nanticoke, Wicomico Rivers and tributaries, northern part Chesapeake Bay; in Rappahannock River, Mobjack Bay and tributaries, southern part of Chesapeake Bay, etc.

Wyo., Laramie—FRAMING YARD—Union Pacific R.R., Omaha, Neb., H. C. Mann, ch. engr., plans framing yard to frame own bridge timbers. $75,000.

Alta., Edmonton—AIRPORT—A. W. Haddon, city engr., making plans hangar at Civic Airport, $45,000; also concrete apron and improvements to Cooking Lake Airbase, $16,000. Noted Apr. 23, C. D.—Apr. 30, E. N.-R.

Newfoundland, St. Johns—WHARVES, etc.—Dpt. P. Wks., Ottawa, Ont., making plans reconstructing wharves and breakwaters at various points, installing radio beacon at Twillingate.

Ont., Ottawa—WIRELESS STATION—Royal Canadian Corp of Signals making plans constructing wireless station at Fort Chipewyan, also modernizing and equipping for air to ground and ground to air and 2-way wireless communication from Fort McMurray to Aklavik. Present sets will be replaced by modern equipment at Artpot Island and Goldfields. R.C.C.S. Dpt. National Defence in market for equipment.

★**Que., Quebec City**—RAILWAY LINE—Provincial Legislature grants permission to Goldfields Transportation Co., Val d'Or, to construct railway line from Mont Laurier to Val d'Or via Maniwaki. Initial cost $2,000,000.

BIDS ASKED

Calif., Glendale—MAUSOLEUM—See "Contracts Awarded."

Calif., Sacramento—NATURAL GAS LINES—See "Contracts Awarded."

Conn., Sherman—TRACT DEVELOPMENT—See "Contracts Awarded."

N. Y., New York—COMFORT STATION—See "Contracts Awarded."

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†*Federal Government*

Unclassified (Continued)

N. Y., New York—ESCALATOR—July 10, by Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., altering 205th Street Station, for installing escalator, Agreement "NH."

N. C., Wilson—RURAL ELECTRIFICATION—Wilson Co. Rural Electric Membership Corp., D. F. Fulghum, pres., Wilson, W. M. Wiggins, mgr. of town, taking bids materials for 129 mi. power lines, rural electrification projects. $161,000. Rural Electric Administration approved loan.

Okla., Oklahoma City—OIL PIPE LINE—See "Contracts Awarded."

Pa., Williamsport—BURIAL GROUND DEVELOPMENT—See "Contracts Awarded."

★**Ont., English River**—GENERATING UNIT—Ontario Hydro-Electric Power Comn., 190 University Ave., Toronto, taking bids installing 2nd generating unit at Ear Falls development on English River near outlet at LacSeul, unit will have a capacity of 5,000 hp. $507,000.

Ont., Cornwall — ICE ARENA — Cornwall Arena Co. Ltd., bids about July 15, constructing new artificial ice rink, Water St. E. $60,000. Architect not appointed. Noted Feb. 17, C. D.—Feb. 20, E. N.-R.

CONTRACTS AWARDED

Ala., Ozark—BUTANE AIR GAS PLANT—See "Public Buildings."

Calif., Glendale—MAUSOLEUM—Forest Lawn Co., 1714 Glendale Ave., 105x128 ft., rein.-con., marble, tile, bronze addition to mausoleum, 1714 Glendale Ave., own forces. Est. $126,000. A. Boyd, 1714 Glendale Ave., archts.

Calif., Sacramento—NATURAL GAS LINES—Pacific Gas & Electric Co., 245 Market St., San Francisco, 2¾ mi. 16 in. steel pipe lines for natural gas supply, own forces. Est. $78,400.

†**Calif., San Francisco** — GASOLINE STATION—Yards & Docks, Navy Dpt., Wash., D. C., constructing commissary gasoline sales station, Spec. 8233, to F. W. Snook Co., 596 Clay St., $2,639. Spec. 7233.

†**Conn., New London**—WHARF—Con. Q.M., Fort H. A. Wright, Fishers Island, N. Y., rebuilding and extending wharf on Thames River, incl. sheet steel piling, bulkhead, wooden fenders, fill, rip rap, etc., to Elliott & Watrous, Water St., Mystic, about $27,000. Noted Apr. 17, C. D.—Apr. 23, E. N.-R.

Conn., Sherman—TRACT DEVELOPMENT—R. E. Farley Organization, 4 Popham Rd., White Plains, N. Y., tract development and 1 story frame dwellings, separate contracts. Est. $140,000. Private plans.

†**Illinois** — WATERFOWL REFUGES — Dpt. Agriculture, Bureau Biological Survey, Wash., D. C., constructing waterfowl refuges at Chautauqua Migratory Waterfowl Refuge, Mason Co., incl. 153,000 cu.yd. excav., to L. E. Tillman, Rockport, $27,536. Bids May 12. Noted June 9, C. D.—Apr. 23, E. N.-R.

★**Kansas**—PIPE LINE—White Eagle Oil Co., subsidiary of Socony-Vacuum Oil Co., Federal Reserve Bldg., Kansas City, Mo., and 26 Broadway, New York, about 8,000 tons approximately 1,100,000 lin. ft. 6 in. steel pipe for gasoline pipe line to be constructed between Augusta, Kan., and Kansas City, Mo., to National Tube Co., c/o U. S. Steel Corp., Carnegie Bldg., Pittsburgh, Pa. Total est. $1,500,000. Noted June 11, C. D.—June 18, E. N.-R.

†**Mass., Hull** — BOATHOUSE and LAUNCHWAY—U. S. Coast Guard, Custom House, Boston, constructing 1 story, 58x44 ft. boathouse and launchway, Point Allerton Coast Guard Station, to M. M. Devine, 294 Washington St., Boston, $21,874. Bids Apr. 2, awarded June 15. Noted Apr. 8, C. D.—Mar. 26, E. N.-R.

†**Mass., Newburyport**—BOATHOUSE, etc.—U. S. Coast Guard, Custom House, Boston, general contract 1 story, 30x58 ft., frame boathouse, 270 ft. timber launchway, on wood pile found., at Merrimac River Coast Guard Station, to Cashman Bros. Co., 75 Water St., $18,837. Bids June 12, awarded June 19. Noted June 18, C. D.

Mich., Detroit—UNDERGROUND CONDUITS—Public Lighting Comn., constructing underground conduits in connection with electric system extensions, P.W.A. Project 1031, to M. P. Murphy, 439 Penobscot Bldg., $57,522. Bids Apr. 23. Noted June 10, C. D.

Nebraska — RURAL ELECTRIFICATION — Southeastern Nebraska Rural Power Dist., Beatrice, 450 mi. transmission lines, to C. F. Lytle, Sioux City, Ia., $366,596. Subject to R.E.A. approval. Bids June 5. Noted May 25, C. D.—Apr. 30, E. N.-R.

N. H., Littleton—DAM—Town, Light & Power Co., Littleton, rein.-con. dam, to H. P. Cummings Constr. Co., 14 Prospect St., Ware, Mass. Est. about $35,000. H. M. Turner, 12 Pearl St., Boston, Mass., engr.

New York—TUNNEL VENTILATION BUILDING—Port of New York Authority, 111 8th Ave., New York, constructing New York Land Ventilation Building, for Mid-Town Hudson Tunnel, to George Colon Foundation Co., 103 East 125th St., New York, $427,000. **P.W.A.** Bids June 9. Noted June 10, C. D.—May 21, E. N.-R.

†**N. Y., Fort Lafayette** — WHARF — Yards & Docks, Navy Dpt., repairing wharf at Naval Magazine, to H. Johnson & Son, 142-05 Holly Ave., Flushing, $9,843.

N. Y., New York—COMFORT STATION—Dpt. Parks, Arsenal Bldg., Central Park, constructing 1 story, comfort station, Cauldwell Ave. and 161st St., by relief labor. **W.P.A.** Owner is purchasing materials. A. Embury, 2nd c/o owner, archt.

Okla., Oklahoma City—OIL PIPE LINE—Hall Briscoe Oil Co., 1st Natl. Bank Bldg., constructing 8 in. oil pipe line on Madison St., day labor. E. D. Hill, Insurance Bldg., engr.

Okla., Oklahoma City—OIL PIPE LINE—Stanolind Pipe Line Co., Tulsa, constructing 7,000 lin.ft. 6 in. oil line on Stonewall St., own forces. $32,000. S. M. Briscoe, Tulsa, engr.

Pa., Pittsburgh — AIRPORT — Comrs. Allegheny Co., bituminous penetration, crushed slag base paving, runways at county airport, Bethel Twp., near here, to McCrady Constr. Co., 239 4th Ave., $363,714. Subject to P.W.A. approval. Noted June 5, C. D.

Pa., Williamsport—BURIAL GROUND DEVELOPMENT—Quaker Hill Cemetery, Inc., Williamsport, W. J. Winner, secy., R.D. 1, developing burial ground in Quaker Hill section, incl. drainage, water system, landscaping, grading, etc., day labor under supervision of secretary. Est. $23,000. Noted June 3, C. D.—June 11, E. N.-R.

R. I., Hillsgrove—AIRPORT IMPROVEMENTS—State, Emergency P. Wks. Comn., State Office Bldg., Providence, grading, drainage work at Rhode Island State Airport, to J. J. McHale & Sons, Inc., 104 Ferris St., Pawtucket, $3,496; constructing runway localizer, to New England Machine & Electric Co., 77 Bayley St., Pawtucket, $3,454. **P.W.A.** Bids May 18, awarded June 9. Noted May 18, C. D.

†**Va., Chicacomico** — BULKHEADS — U. S. Coast Guard, bulkheads for U. S. Coast Guard Station, to E. E. Weddle & Co., Norfolk, $5,400.

Ont., Niagara Falls—WALL—See "Streets and Roads."

MATERIALS AND EQUIPMENT

PROPOSED WORK

FLOOD LIGHTING SYSTEM MATERIALS—**Hayward, Calif.**—J. Harder, Jr., clk. Hayward School Dist., 1074 C St., will purchase light poles, light reflectors, lamps and electrical wiring for flood lighting system at Bret Harte School Grounds. To exceed $1,000.

FREQUENCY CHANGERS — **Los Angeles, Calif.**—D. P. Nicklin, purch. agt. Dpt. Water & Power, 207 South Bway., rejected bids May 11, 2 each frequency changers, for changing 50 cycle to 60 cycle, Spec. 1961. To exceed $2,000. Noted May 5, C. D.

STORAGE TANKS—**San Pedro, Calif.**—Shell Oil Co., 1008 West 6th St., Los Angeles, plans erecting 2 steel storage tanks at rear of Berths 167 and 168, Los Angeles Harbor. $16,000. R. R. Bacon, c/o owner, engrs.

STREET SWEEPING MACHINE—**Southgate, Calif.**—G. Nevill recommended to City Council that City purchase 1 street sweeping machine during next fiscal year. $7,000.

STREET SIGN PLATES—**Chicago, Ill.**—City, City Hall, rejected bids June 1, 46,000 enameled street sign plates, f.o.b. 1533 South Laflin St. Will readvertise. Noted May 27, C. D.

†FIRE HYDRANTS—**Portland, Me.**—Treas. Dpt. at office Sup. Archt., Wash., D. C., rejected bids furnishing fire hydrants and fire alarm boxes at U. S. Marine Hospital. Will readvertise. Noted May 8, C. D.—Apr. 16, E. N.-R.

TRUCK, etc.—**Elbow Lake, Minn.**—Grant Co., C. M. Nelson, aud., plans purchasing one 4-wheel drive truck and snow plow for same. W. E. Burgess, co. hy. engr.

TRUCK, etc.—**Fergus Falls, Minn.**—Ottertail Co. plans purchasing one 4-wheel drive truck and snow-plow equipment for same. H. L. Sandin, co. hy. engr.

TRUCK—**Hibbing, Minn.**—Village plans purchasing light service truck for Water & Light Comn.

†NAILS, etc.—**Kansas City, Mo.**—U. S. Eng., 232 Mfg. Exch. Bldg., rejected bids June 8, 12,850 lb. nails and 126,000 ft. ¾ in. strand. $4,000. Will readvertise. Noted June 3, C. D.

STEEL TANKS — **St. Louis, Mo.** — R. J. Holmes, 1001 North Sarah St., applied for permit to install one 1,000 gal. and two 560 gal. underground steel tanks for gasoline for automobile service station, 1001 North Sarah St.

STEEL TANKS—**St. Louis, Mo.**—L. Levin, 1205 Gravois Ave., granted permit to install

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†*Federal Government*

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Handsomely symmetrical—ready for action all the time—built for years and years of service—every point of Ludlow Hydrants is strictly first-class.

Compare: Full force—no obstruction in waterway. Non-freezing—drains from the bottom. Inside design—eliminates surges and water hammer. Replaceable without digging—breaks above ground in case of accident. Maintenance—all parts easily removable.

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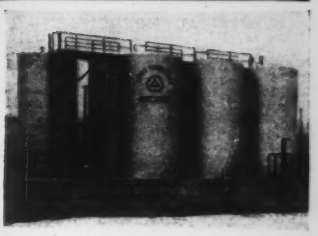
OIL AND GASOLINE TANKS



All welded, bulk storage and filling station tanks—built by experienced workmen—full weight material—one piece dished heads—wide rings, one plate to each ring—assembled by shielded arc welding method—the result an ALL WELDED TANK, virtually a ONE PIECE TANK—PDM gives you the best tanks at a competitive price.

Pittsburgh DES MOINES STEEL COMPANY
3414 Neville Island, Pittsburgh
915 Tuttle St., Des Moines

Materials, etc. (Continued)

two 500 gal. underground steel tanks for gasoline for automobile filling station, at 1205 Gravois Ave.

STEEL TANKS — **St. Louis, Mo.** — Socony Vacuum Oil Co., Inc., 4140 Lindell Blvd., granted permit to install two 1,000 gal. underground steel tanks for gasoline and one 1,000 gal. underground steel tank for fuel for use in automobile service station, 1204 Chouteau Ave.

TANK—**St. Louis, Mo.**—M. Castelli, 1405 North 13th St., applied for permit to install two 1,000 gal. underground steel tanks for gasoline for automobile service station at 1405 North 13th St.

TANK — **St. Louis, Mo.** — C. Koerseh, 531 South 6th St., applied for permit to install one 3,000 gal. underground steel tank for gasoline in automobile filling station, 531 South 6th St.

TANKS—**St. Louis, Mo.**—Rambler Oil Co., 7929 Alabama Ave., applied for permit to install two 20,000 gal. underground steel tanks for automobile service station, 7929 Alabama Ave.

TANKS—**St. Louis, Mo.**—M. H. Reis, 1400 North Vanderventer Ave., granted permit to install three 1,000 gal. underground steel tanks for gasoline at service station, 1400 North Vandeventer Ave.

TANKS—**St. Louis, Mo.**—York Building & Investment Co., 6427 Chippewa St., granted permit to install three 1,000 gal. underground steel tanks for service station, 6427 Chippewa St.

DUMP TRUCK—**Albany, N. Y.**—Common Council, City Hall, appropriated $3,400 for purchasing ½ ton dump trucks for Dpt. Water & Supply.

TANKS—**Brooklyn, N. Y.**—C. Pfizer & Co., 11 Bartlett St., plans purchasing 3 metal tanks for bulk storage, River St. near Grand St. $100,000. A. V. Bekay, 323 Elmwood Ave., archt.

STEEL TANKS, etc.—**Buffalo, N. Y.**—Buffalo Cement Co., 2731 Main St., plans installing 500 gal. steel tanks, electric pump, air compressor, etc. at service station to be established at 2137 Main St. To exceed $1,000.

STORAGE TANKS—**Fallsburg, N. Y.**—Owner, c/o A. H. Okun, archt., 16 Starr Ave., Monticello, plans purchasing 500-1,000 gal. storage tanks for proposed gasoline storage plant.

ELECTRIC PUMP—**Jamestown, N. Y.**—W. F. Endress, Inc., Foote Ave. and Harrison St., plans installing three 500 gal. steel tanks, electric pump, air compressor, etc. at gasoline service station. $1,000 or more.

TANKS—**Jamestown, N. Y.**—Swan-Hall Oil Co., J. Swanson, genl. mgr., Buffalo and 2nd Sts., plans installing 500 gal. steel tanks, electric pump, air compressor, etc., at gasoline service station to be established at 869 Foote Ave. To exceed $1,000.

ELECTRICAL EQUIPMENT — **Ossining and Harmon, N. Y.**—New York Central R.R. Co., J. W. Pfau, ch. engr., 466 Lexington Ave., New York, furnishing one 60 cycle, 3,000 k.w. mercury arc rectifier and automatic switchboard apparatus for substation No. 6, Ossining; and 2 similar units for Substation 6A at Harmon. To exceed $1,000.

CABLE—**Cleveland, O.**—City soon takes bids 8,000 ft. 7 conductor 18 stranded rubber cable and 4,500 ft. signal cable.

METERS—**Cleveland, O.**—City, C. W. Patterson, purch. agt., soon takes bids one thousand two hundred thirty-five 5 to 50 ampere 2 wire, and 115 and 230 volt meters, three hundred ten 15 to 50 ampere 3 wire, 115/230 volt meters.

SERVICE SWITCHES—**Cleveland, O.**—City, C. W. Patterson, purch. agt., soon takes bids furnishing one thousand one hundred fifteen 60 to 200 ampere, 250 V., 2 and 3 pole service switches.

ORNAMENTAL LIGHT STANDARDS—**Edinboro, Pa.**—Borough plans purchasing 20 or more ornamental light standards and equipment. To exceed $1,000.

STEEL TANKS—**Erie, Pa.**—Pennzoil Co., Drake Bldg., Oil City, A. W. Clinger purch. agt., plans installing 500 and 1,000 gal. steel tanks, electric pump, air compressor, etc., at service station to be built at 2731 Parade St. To exceed $1,000.

TANKS, etc.—**Phila., Pa.**—M. Kalish, 63rd St. and Grays Ave., plans installing 500 gal. steel tanks, electric pump, air compressor, etc., at service station to be built at 6238 Grays Ave. $1,000 or more.

STEEL PIPE, etc.—**Warren, Pa.**—Syndicate, E. F. Allen, 161 West Main St., Westfield, N. Y., plans purchasing 250 ft. or more 5½ in. and 1,400 ft. 2 in. steel pipe, 1,400 ft. 1¼ in. pumping rods, jacks and other equipment. $1,000 or more.

ELECTRIC HOIST—**Park City, Utah**—Silver King Coalition Mines Co., Kearns Bldg., Salt Lake City, plans installing new 400 h.p. electric hoist. M. G. Heitzman, Park City, engr.

★STEEL RAILS—**Norfolk, Va.**—Norfolk & Western R.R. soon takes bids 20,000 tons rail. Est. about $700,000.

BIDS ASKED

STEEL PIPE—**Birmingham, Ala.**—July 7, by City, furnishing, delivering 86,000 lin.ft. 60 in. welded steel pipe to Village Springs. Engineering Comn., 501 Martin Bldg., Birmingham, engrs.

TRACTOR—**Eureka, Calif.**—A. W. Kildale, city clk., taking bids caterpillar type tractor with minimum of 20 h.p. and maximum of 30 h.p. allowance is to be made for used tractor now owned by city.

MOTOR GRADER, etc.—**Fresno, Calif.**—H. S. Foster, city clk., taking bids (**A**) 1 power controlled motor grader with 12 ft. blade and scarifier without cab (**B**) one road disc mounted on pneumatic tires with positive adjustment control (**C**) one used motor-driven street sweeper, mounted on pneumatic tires.

†STEEL, etc.—**Wash., D. C.**—July 2, by General Purchasing Officer Panama Canal, furnishing steel, steel pipe, lead pipe, boiler tubes, fencing materials, platform scales, etc., Schedule 3157.

STREET PLATES—**Chicago, Ill.**—City, City Hall, O. E. Hewitt, comr., taking new bids for 46,000 street name sign plates. Asked W.P.A. for funds for project.

PAINT, etc.—**Baltimore, Md.**—July 1, by Bd. Awards, furnishing, delivering paint for repair shops; maps, map cases, globes, charts, textiles for Home Economics Classes, all for Dpt. Education, for City, 3 East 25th St.

DREDGING OUTFIT—**Winona, Minn.**—July 6, by City, dredging outfit, crawler type, gas-engine powered, operating one yd. bucket. E. E. Chadwick, city engr.

†CONVEYOR UNITS — **Vicksburg, Miss.** — July 7, by U. S. Eng., P. O. Box 667, 2 screw conveyor units for handling bulk Portland cement in storage barges, f.o.b. Greenville.

†DREDGE TENDER—**Vicksburg, Miss.**—July 3, by U. S. Eng., P. O. Box 667, rental of 1 dredge tender, f.o.b. Vicksburg.

†PIPE—**Vicksburg, Miss.**—July 17, by U. S. Eng., Vicksburg, furnishing and delivering pipe.

PUMPS, etc.—**St. Louis, Mo.**—June 30, by B. L. Brown, pres. Bd. P. Service, City Hall, furnishing, installing gasoline pumps and underground steel tanks for gasoline, 9th, 10th and Mounted District Police Stations now under construction; furnishing telephone switchboards, for 5 new district police stations at various locations. E. C. E. Becker, city engr.

ASPHALT and CEMENT, etc.—**Trenton, N. J.**—June 29, by F. A. Brodesser, state purch. agt., 235 tons asphalt and cement, 4,168 lin.ft. 6- to 24-in. pipe D.S. make concrete.

CORRUGATED PIPE, etc. — **Binghamton, N. Y.**—A. Calabrisi, procurement officer W.P.A., Procurement Div., Binghamton, taking bids corrugated pipe delivered to Slaterville; cement delivered to Ithaca; concrete pipe delivered to Opauqa Lake; corrugated pipe delivered to Marathon; road oil delivered to Lumberland; road oil delivered to Middletown; brick delivered to Delhi; shingles delivered to Dehli, and cement delivered to Oneonta, for various W.P.A. projects in Binghamton Dist.

TANK—**Buffalo, N. Y.**—Buffalo Cement Co., 2747 Main St., taking bids 1,000 gal. steel gasoline storage tank and full equipment for service station, to be built at 2729 Main St. To exceed $1,000.

STORAGE TANK—**Glens Falls, N. Y.**—Empire Gasoline Co., Inc., 191 Glen St., taking bids 1,000 gal. storage tank for service station, Upper Glen St. To exceed $1,000.

SPECIAL WORK—**New York, N. Y.**—July 7, by Bd. Transportation, J. H. Delaney, chn., 250 Hudson St., supplying special work (rails, frogs, switches), for Rapid Transit R.R., Order No. 67.

TANK—**Rensselaer, N. Y.**—Socony Vacuum Oil Co., Inc., 112 State St., Albany, in market for storage tank for service station to be built at Columbia St. and Aiken Ave. A. J. Waddell, in charge.

FEED MILL—**Springville, N. Y.**—J. H. Gray Milling Co., E. B. Dunbar, mgr., Little Valley, in market for machinery and equipment, incl. transmission and conveying equipment, for feed and flour mill.

TANK — **Tonawanda, N. Y.** — Sun Oil Co., River Rd., Tonawanda, in market for 500 or 1,000 gal. steel gasoline storage tanks for service station at Main St. and Holland Pl. J. Coon, in charge, for owners.

JACKET FIRE HOSE, etc.—**Kingston, Pa.**—July 6, by C. H. Blochberger, boro secy., 2,000 ft. 2½ in. double jacket fire hose, couplings, etc. $2,000.

†PORTLAND CEMENT — **Memphis, Tenn.** — July 8, by District Engineer, at U. S. Engineer Office, on Arkansas side of Mississippi River (opposite here), 53,000 bbl. American Portland cement.

TANKS—**Brantford, Ont.**—Canadian Oil Co. Ltd., in market for 12,000 gal. storage tanks for gasoline and oil and other equipment and tools for garage. $5,000.

SEWER MATERIALS—**Crawland, Ont.**—See "Contracts Awarded."

PIPE—**Owen Sound, Ont.**—W. H. Wardell, city engr., in market for 513 ft. 8 in. c.i. 3337 ft. 2 in. galvanized iron pipe. Work will be carried out by day labor.

PIPE — **St. Thomas, Ont.** — Municipality in market for materials, incl. 900 ft. 36 in. and 800 ft. 24 in. concrete sewer pipe. W. C. Miller, City Hall, engr.

OIL—**Weston, Ont.**—H. G. Musson, town clk., in market for 10,000 gal. oil for dust laying purposes.

TANKS, etc. — **Regina, Sask.** — Neil Motors Co., 11th Ave., in market for two 500 gal. gasoline tanks and 4 pumps, also need garage tools. To exceed $1,000.

CAST IRON PIPE — **LaTugue, Que.** — P. E. Riberdy, Box 125, in market for 1,200 ft. 4 in. c.i. pipe.

CONTRACTS AWARDED

†REINFORCING BARS—**Los Angeles, Calif.** —U. S. Eng., 751 South Figueroa St., furnishing steel reinforcing bars, intermediate grade. Proposal 719, to Soule Steel Co., 6200 Wilmington St., $59,475. Bids June 12, awarded June 16.

ROAD MATERIALS—**Los Angeles, Calif.**—H. E. Russell, purch. agt., Los Angeles Co., 524 North Spring St., 1,000 tons pre-mix, to Vernon Paving Co., 3200 Vernon Ave., $2,090•••525 tons pre-mix rock and oil, to Griffith Co., 502 Los Angeles Railway Bldg., $1,565, both Spec. 1441; 2,640 bbl. SC-3 road oil, 475 bbl. SC-1A, 60% road oil and 180 bbl. 90% road oil, Spec. 1440, to San Fernando Refining Co., San Fernando, $6,042. Grand total $9,697. Bids May 27.

STEEL WATER PIPE—**Los Angeles, Calif.**—D. P. Nicklin, purch. agt. Dpt. Water & Power, 207 South Bway., electric fusion welded steel water pipe, 30 ft. sections 24 in. I.D. ¼ in. wall, 15,450 ft. B and S ends, 30 ft. spigot end, 210 ft. spigot ends, 2,715 ft. B and S ends, also 6,056 lin.ft. 36 in., same, and fittings, Spec. X-26, to Western Pipe & Steel Co., 5717 Santa Fe Ave., $115,868. Bids May 27, awarded June 9. Noted June 4, C. D.

†TRANSIT MIXED CONCRETE—**Los Angeles, Calif.**—U. S. Eng., 751 South Figueroa St., 700 cu. yd. transit-mixed concrete to Consolidated Rock Products Co., 2730 South Alameda St., Vernon, $4,025. Est. about 4,500. Bids June 8.

PUMPING UNIT—**Manhattan Beach, Calif.** —City Clerk, 1 pumping unit, 400 g.p.m. against 200 ft. head, complete with 40 hp. motor, to Byron Jackson Co., 4150 East Slauson St., Huntington Park, $1,468, plus $42.75 sales tax. Bids May 21. Noted June 1, C. D.

ASPHALTIC CONCRETE MIX—**Merced, Calif.** —City Council, furnishing 400 to 500 tons asphaltic concrete pavement mix, to Valley Paving & Constr. Co., P. O. Box 1349, Fresno, $4.65 per ton. Noted June 5, C. D.—June 11, E. N.-R.

CAST IRON PIPE FITTINGS, etc.—**Oakland, Calif.**—J. H. Kimball, secy. East Bay Municipal Utility Dist., 512 16th St., 2,355 c.i. pipe fittings 4- to 12-in., Spec. LS-174, to Grinnell Co. of the Pacific, 5th and Brannan Sts., San Francisco, $6,422•••50,000 ft. ¾ in. seamless copper tubing, Spec. LS-172, to Mueller Co., 1072 Howard St., San Francisco, $6,220••• 350 six in., 50 four in., 50 eight in. gate valves, Spec. LS-173, to Rensselaer Valve Co., 55 New Montgomery St., San Francisco, $5,983. Grand total $18,625. Bids May 27. Noted June 9, C. D.

TRACTORS, etc. — **Oakland, Calif.** — A. H. Abel, secy. City Port Comn., 2 dock tractors and sixty 4-wheel dock trucks, to Superior Grinding & Motor Parts Co., 865 Post St., San Francisco, $1,745 and $2,700 respectively••• 1 dock lift truck, 3 ton, to Baker-Rawling Co., 1061 Howard St., San Francisco, $2,450•••one used 15 ton locomotive crane, to Barron Estate Co., Russ Bldg., San Francisco, $3,500. Grand total $10,395. Bids May 23.

FIRE HYDRANTS, etc.—**San Francisco, Calif.** —T. A. Brooks, city purch. agt., 300 low pressure fire hydrants and parts, to M. Greenberg & Sons, 765 Folsom St., $19,950. Noted May 7, C. D.—Apr. 30, E. N.-R.

ASPHALT EMULSION—**Calumet City, Ill.**—Calumet City, 38,870 gal. asphalt emulsion and 3,800 gal. MC-1 liquid asphalt, to Seneca Petroleum Co., 439 West 33rd St., Chicago, 15.1c. and 12.25c. per gal. respectively. Awarded June 11.

PIPE—**Chicago, Ill.**—City, Dpt. P. Wks., City Hall, 689 tons 24 in. Class B c.i. water pipe, to Glamorgan Pipe & Fdry. Co., 122 South Michigan St., $45.80 per ton. Bids June 2, awarded June 2. Noted May 29, C. D.

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†*Federal Government*

Materials, etc. (Continued)

WATER PIPE—Chicago, Ill.—City, City Hall, 4- to 12-in. water pipe, to U. S. Pipe & Fdry. Co., 122 South Michigan Ave., 8 in. and 12 in. at $45.25 per ton; 4 in. at $48.25 per ton. Bids June 2. Noted May 27. C. D.

CRUSHED STONE, etc. — Niles, Ill. — City, City Hall, 500 tons crushed stone and 300 tons sand, to Consumers Co., 111 West Washington St., Chicago, $1.40 per ton and $1.17 per ton respectively***2,000 bd.ft. form lumber, to Hillbean Lumber Co., $35 per 1,000***1,000 lin.ft. bituminous expansion joints, to Material Service Co., 33 North LaSalle St., Chicago, ½ in. at $3.15 per 100 ft. and 1 in. at $3.55 per 100 ft.***720 bbl. cement, to Edison Fuel & Material Co., 6615 North Avondale Ave., Chicago, at $2.35 per bbl. in cloth sacks, subject to 40% disc. per bbl. Bids June 2, awarded June 4.

†**PORTLAND CEMENT — Duluth, Minn.** — U. S. Eng., Canal Park, furnishing 2,500 sacks Portland cement, to C. O. Backlund, Grand Marais, $1,550. Bids June 16. Noted June 9, C. D.—June 11, E. N.-R.

CEMENT—Minneapolis, Minn.—City, 6,000 tons asphaltic cement and 200 tons cut-back asphalt, to Standard Oil Co. of Indiana, 1300 Harmon Pl., $16.50 per ton and $15.93 per ton respectively***300 tons asphalt cement filler, to Berry Asphalt Co., 1472 West 76th St., Chicago, Ill., $20.70 per ton***100,000 gal. emulsified asphalt, to Shell Petroleum Corp., 528 Roanoke Bldg., $19.45 per ton or 8.072c. per gal. net. Bids June 11.

LUMBER — Meridian, Miss. — M. Cemeron, chancery clerk, Lauderdale Co., Court House, furnishing creosoted and bridge lumber, to Gulf States Creosoting Co., Burwell Bros., G. Harvey, E. G. Mosley, all of Meridian. Bids June 2. Noted May 27, C. D.

STEEL RAILS—Kansas City, Mo.—Kansas City Southern R.R. Co., A. N. Reece, ch. engr., 11th and Wyandotte Sts., 3,000 tons steel rail, to Carnegie Illinois Steel Co., Carnegie Bldg., Pittsburgh, Pa., about $100,000; 1,000 tons, to Inland Steel Co., 38 South Dearborn St., Chicago, Ill., about $34,000. Track work in Oklahoma, Texas and Missouri by day labor and separate contracts. (**Correction**—name of owner). Noted June 2, C. D.—June 4, E. N.-R.

★**STEEL RAIL, etc.—St. Louis, Mo.**—Missouri Pacific R.R. Co., S. L. Wonson, ch. engr., Missouri Pacific Bldg. (with approval of U. S. Dist. Judge G. H. Moore and G. A. Thompson, Federal Trustee), 112 tons steel rail to Colorado Fuel & Iron Co., Pueblo*** to Illinois Steel Co., 208 South LaSalle St., Chicago, Ill., and to Inland Steel Co., 38 South Dearborn St., Chicago, Ill.***tie plates, to Sheffield Steel Corp., 6700 Manchester Ave.*** to Republic Steel Co., 4th St., Pittsburgh, Pa., and to Weirton Steel Co., Weirton, W. Va.*** rail anchors, to Achuff Railway Supply Co., 4908 Delmar Blvd.***to P. and M. Co., 80 East Jackson Blvd., Chicago, Ill.***to Positive Anchor Rail Co., 332 South Michigan St., Chicago, Ill.***to American Fork & Hose Co., North Girard, Pa.***to Woodlings Forge & Tool Co., Vernon, Pa., and to Handlan, Inc., 212 North 3rd St., St. Louis***rail joints, to Rail Joint Co., Pueblo, Colo., and Fairfield, Ala.***spikes and bolts, to Colorado Fuel & Iron Co., and to Sheffield Steel Corp., 6700 Manchester Ave. Total est. $691,000.

SWITCHGEAR—Nebraska—Loup River Public Power Dist., C. B. Fricke, pres., 2307 13th St., Columbus, furnishing, installing switchgear and switchboard for automatic and remote control at Monroe Power Plant, to Westinghouse Electric Co., East Pittsburgh, Pa., $63,436. Bids Feb. 4. Noted Feb. 18, C. D.—Jan. 30, E. N.-R.

†**TELEPHONE EQUIPMENT—Boulder City, Nev.**—Bureau Reclamation, Denver, Colo., furnishing, delivering 2 complete units manual telephone equipment for installation in Boulder Dam and power plant, Boulder Canyon Project, to American Automatic Electric Sales Co., 103 West Van Buren St., Chicago, Ill., $11,044. Bids Apr. 20. Noted Mar. 24, C. D.—Mar. 26, E. N.-R.

TILE PIPE, etc.—Geneva, N. Y.—City, City Hall, 300 ft. 12 in. tile pipe, to W. L. Vogt & Sons, Geneva, at 455c. per lin. ft.*** 114 bbl. cement, to T. D. Beard, Geneva, $2.59 per bbl. *** 110 tons bituminous material, to General Crushed Stone Corp., Union Bldg., Syracuse, $5.75 per ton.

CEMENT, etc.—Syracuse, N. Y.—Procurement Div., G. L. Noble, procurement officer W.P.A., Old Post Office Bldg., 1,000 bbl. Portland cement for Ley Creek Sewer, for Ley Creek Sewer Dist., Onondaga Co., Syracuse, to Wilson & Green Co., 516 Burt Ave., Syracuse, at $2.72 per bbl.

CORRUGATED METAL PIECE, etc.—Raleigh, N. C.—Div. Purchase & Contr., Raleigh, A. S. Brower, dir., to Dixie Culvert & Metal Co., 801 Fayetteville St., corrugated metal pipe, f.o.b. Tapoca, $397; f.o.b. Lexington, $1,419; f.o.b. Winston-Salem, $1,411***to Wheeling Corrugating Co., Richmond, Va., f.o.b. Brevard, $1,384; f.o.b. Rutherforton, $1,505***to J. B. Hunt & Sons, Odd Fellows Bldg., f.o.b. Walnut Cove, $1,410***to Roanoke Iron & Bridge Wks., Roanoke, Va., steel doors, locking bars and barred partitions complete for camps and hospitals at Salisbury, $1,530; Lexington, $987; Dallas, $1,009***to Peden Steel Co., 512 West Hargett St., for camps and hospitals at Roxboro, $1,023* Lillington, $995***to Belmont Iron Wks., 22nd St. and Washington Ave., Phila., Pa., structural steel for prison camps at Salisbury, Roxboro, Lillington, Lexington and Dallas, $7,727***to Wood Preserving Corp., Up King St., Charleston, S. C., 12,636 bd. ft. creosoted timber, f.o.b. River Bend siding, $821 ***to Maxwell Co., Newberry, 500 kegs 60 D common wire nails, f.o.b. Hickory, $1,343*** to American Hardware & Equipment Co., 217 West 1st St., Charlotte, 36 grindstones, $155; 6 dozen post hole diggers, 9 in. blades, 5 ft. digger, $72***to Brown-Rogers-Dixson Co., Winston-Salem, 24 dozen asphalt rakes and 24 dozen heavy lawn rakes, $662***to Glasgow-Allison Co., North College St., Charlotte, 36 dozen cutter mattocks, without handles, $246 ***to Sanders Motor Co., 329 South Blount St., 20 coaches, $9,548; 5 sedans, $2,615. Grand total $36,259. Bids June 4. State Division Purchase & Contr., A. S. Brower, dir., furnishing bituminous paved invert or standard asphalt coated corrugated metal pipe, to Dixie Culvert & Metal Co., 801 Fayetteville St. Noted May 29, June 2 and 3 C. D.

AIR COMPRESSOR — Cincinnati, O. — City, furnishing one stationary air compressor for Hy. Maintenance Dpt., to Highway Equipment Co., 1359 Earnst St., $5,835.

BITUMINOUS MATERIALS—Pennsylvania—Commonwealth of Pennsylvania, Secretary Property & Supplies, Harrisburg, furnishing bituminous materials, f.o.b. various points, Items 1 to 47 (inclusive), to York Valite Co., York, $10,177; Item 48, to Amiesite Corp. of Pennsylvania, Elverson Bldg., Phila., $1,742. Bids June 1. Noted May 27, C. D.

STEEL TANKS, etc.—Wilkes-Barre, Pa.—Socony Vacuum Oil Co., Rockefeller Plaza, New York, installing 500 gal. steel tanks, electric pump, etc., at gasoline service station to be built at Carey Ave. and Academy St., to A. J. Sordoni Constr. Co., Wilkes-Barre. Est. about $20,000. Noted June 1. C. D.—June 4, E. N.-R., under "Contracts Awarded."

†**OPERATING MACHINERY, etc.—Knoxville, Tenn.**—Tennessee Valley Authority, Knoxville, operating machinery for Pickwick lock gates and outrigger snatch block and sheave assemblies for haulage winches, to Hardie Tynes Mfg. Co., 800 North 28th St., Birmingham, Ala., $24,500***operating machinery for segmental valves at Pickwick Lock, to Alliance Machine Co., Alliance, O., $22,300***wearing surface on roads at Nitrate plant at Muscle Shoals, to Carey Reed Co., Lexington, Ky., $23,300*** mixer plant structure and batching equipment for Gunthersville Dam, to C. S. Johnson Co., Champaign, Ill., $16,900. Grand total $87,000. Bids May 1. Noted Apr. 16, C. D.—Apr. 23, E. N.-R.

PIPE—Everett, Wash.—City Water Dpt., City Hall, 4,000 ft. 6 in. steel pipe, to Lloyd Hardware Co., 1401 Hewitt St., $2,083.

PUMP—Kelso, Wash.—Diking Dist. 15, c/o Cowlitz Co. Comn., Federal Office Bldg., Seattle, furnishing electric pump, to Fairbanks-Morse Co., 1226 First South St., Seattle, $1,391. Bids June 9, awarded June 16. Noted June 18, C. D. —June 25, E. N.-R.

GRAVEL—Lake, Wis.—Town, 5,000 cu. yd. gravel, to Edgar Fink, South Milwaukee, $1.30 yd. delivered, 70c. yd. at pit.

CALCIUM CHLORIDE — Milwaukee, Wis. — Milwaukee Co., 50,000 lb. flake calcium chloride, to Reichll & Korfman Co., 221 East Clybourn St., at $1.27 per 100 lb.

†**PORTLAND CEMENT—Milwaukee, Wis.**—U. S. Eng., furnishing 2,700 bbl. Portland cement, to Huron Portland Cement Co., 1325 Ford Bldg., Detroit, Mich., $2.40 per bbl., 10c. discount. Bids June 5, awarded June 8. Noted May 29, C. D.

GRAVEL—Caledon Twp., Ont.—E. Harrison, twp. supt., Orangeville, crushing, hauling gravel for township roads, to H. MacArthur, Caledon. To exceed 1,000. Noted May 25, C. D.

SEWER MATERIALS — Crawland, Ont.—Town, W. P. Marshall, clk., Aqueduct St., Wellington, will purchase materials for installation of 12 in. sewer, day labor.

STONE and GRAVEL—Glanford Twp., Ont.—Glanford Twp., crushing and hauling stone and gravel for twp. roads, to Earl Hensan, 209 Park Row Ave., and F. Calzovetti, 233 Hughson St. N., Hamilton. Est. exceeds $1,000.

GRAVEL — Kitchener, Ont. — Wilmot Twp. supplying and delivering 6,000 yd. gravel for twp. roads, to Paul Bergmann, Lancaster St. W., at 43c. and 47c. per yd.

MOTOR GRADER—Pembroke, Ont.—Renfrew Co., supplying power-controlled motor grader, to J. D. Adams Ltd., Paris, $3,591.

GRAVEL and OIL—Saskatoon, Sask.—Municipality, supplying 1,200 yd. road maintenance gravel, to Evans Gravel Surfacing Co. Ltd., Saskatoon, $1,740; supplying 55,000 gal. asphaltic oil, to Imperial Oil Co., $7,667.

FOREIGN

Argentina, Buenos Aires—Argentine Government authorized spending 300,000 pesos ($100,000,000), on additional net 29,400 mi. of highway of which 3,100 mi. will be paved; 8,000 mi. improved and the rest dirt roads. To be completed in 1940.

China, Shanghai—City plans constructing rein.-con. superstructure on wooden pile wharf, the deck will be 50 ft. wide, equipped with bollards, mooring posts, spaced 50 ft. in addition to cleats for small vessels, ample crane equipment will be provided, 4 story, 130x220 ft., warehouses, 2 steel sheds, 8 elevating trunks, 4 stackers, 1 one ton mobile crane, 1 six ton crane, 150 ft. gantry rollers, etc., at Point Island. $7,000,000.

Egypt, Cairo—Egyptian Government awarded contract supplying 20 rail cars, to Ganz Wks. Co., Budapest. $750,000.

England — July 13, by Clerk of **London** County Council, County Hall, constructing new steel bridge of deck of cantilever type with concrete piers and abutments faced with granite over River Thames at Wandsworth*** July 1, by C. W. Radcliffe, clk. Middlesex County Council, Guildhall, Westminster S.W. (1) central boiler plant, incl. 3 self-contained economic type boilers, induced draft plant, boiler feed pumps, blow down piping and accessories; (2) central boiler plant with calorifiers, circulating and intensifier pumps, water softening, disinfector, cold water, hot water and condensating works, steam, water, condensate piping and all fittings, accessories, (3) low pressure hot water heating plant by panel radiators, radiators, domestic hot water supply plant, steam supply and condensing services, and gas supply mains. **London***London Laboratories Ltd., Royal Court Chambers, Sloane Square, S.W. **London,** in market for complete machine tool equipment, suitable for manufacture of high class internal combustion engines experimental work***G. Cohen Sons & Co., Ltd., Wood Lane, West, **London,** in market for 4,000 ton multiple ram hydraulic press with 10-14 ft. long table by 4x6 ft. wide, also for double helical wheel and pinion reduction 10 or 12 to 1***Soag Machine Tools, Ltd., 7 Juxon St., Lambeth, S.E. in market for overhead traveling crane, single grinder type, 3 tons capacity, span 8 ft. lifting height 10 ft. clearance for top of rail, **London***W. E. and E. C. Raley Joint Clerks, Hoyand Nether Urban District Council, Regent St., **Barnsley,** invited plans for 210 houses on Hawshaw Lane; 26 bungalows on Market St. and 31 bungalows at Skiers View Rd., $600,000 J. R. Shenerd, Town Hall, Hoyland Nether, archt. ***Falmouth** Municipality, pair of dock gates, opening 75 ft., each gate 43 ft. long by 36 ft. high, operating machinery and 200 tons steel work to Head Wrightson & Co., Ltd., Thornaly-on-Tees***F. H. J. Tomes, engr. Witham and Sleeping Rivers Catchment Board, 50 Wide Bargate, **Boston,** listing of names of contractors for supplying and constructing 2 pumping stations at Skegnese, each with two 36 in. centrifugal pumps to deliver combined discharge of 126 cu.ft. per sec. against average static head of 10 ft. with maximum head of 13 ft. Diesel heavy oil engines of 130 hp. each, rein.-con. buildings, foundations, and culverts***Keighley** Municipality awards contract 10 retorts to Drakes Ltd., Halifax***Grange** Urban District Council, transformers, to Brush Electrical Eng. Co., Ltd., Loughborough*** **Bury** Municipality, sewage screening plant, steel channels and adjustable weir plates, to Ames, Crosta, Mills & Co., Ltd., Heywood, Lancashire ***Grimsby** Municipality, 6,600 volt switchgear, to English Electric Co., Ltd., Stafford, $16,185; transformers, to Brush Electrical Eng. Co., Ltd., Loughborough, $5,535; 3 low pressure switchboards to W. Lucy & Co., Ltd., Oxford, $4,525; 11,000 volt and 6,600 volt cable, to Johnston & Philips Ltd., Chareton, London, $18,445***Sutcliffe, Speakman & Co., Ltd., **Leigh,** plans plant addition for manufacturing activating carbon for use in solvent recovery and gas masks, $500,000***Sebco Ltd., Willenhall Rd., **Wolverhampton,** in market for flexible wire rope 1 to 1-in. diam.***Midland Iron & Hardware Co. Ltd., **Cradley Heath,** in market for considerable quantity of 4 in. outside diam. tubes***Briggs & Thornly, archts., Royal Linner Bldg., Liverpool, **Stephney,** listing names of bidders for municipal building, $1,449,075 and electrical commission building, $519,950 for Stephney Borough Council ***Middlesex County Council, **Enfield,** institutional building, to A. Monk & Co., Edmonton, $694,535***Bd. St. Dunstan's Hospital, **Brighton,** plans hospital, $510,000, architect not appointed***Durham** Municipality plans police headquarters building, $612,500*** **Bristol** Municipality voted $3,000,000 for 2,114 housing scheme***Liverpool** Municipality awards capstan lathe, to H. H. Ward & Co. Ltd., Birmingham, $1,910; fifty 20 ton hopper wagons, to Metropolitan Carriage Co., Ltd., Nottingham, $12,200; metal enclosed switchgear at 2 substations, to Switchgear & Cowans Ltd., Manchester, $70,090; 2 Lancashire boilers, to Johns Thompson Ltd., Wolverhampton, $17,715*** **Maden & McKee Ltd., 317 Prescot Rd., Liver-**

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†*Federal Government*

Foreign (Continued)

pool, in market for 15 ton electric derrick crane with 150 ft. gib to suit current 400 volt, 3 phase, 50 cycle; 28x8 ft. Lancashire boiler, 120 lbs. with mechanical stoker•••J. Law & Sons, 8 Victoria St., **Liverpool,** in market for bathroom accessories. Would like catalogues and price lists.

England — Portsmouth Municipality voted $1,355,000 for constructing flying boat base at Langstone Harbor. Councellor A. Johnston, chn. Docks & Harbor Committee, listing names of intending bidders. Work will include two 1 mi. runways; 200 yds. wide; fairway and mooring base to be dredged; hangars and approach roads constructed. Plan to vote $5,574,250 in 1937 for 2nd section•••Ministry of War, **Chorley,** purchases site and will erect explosives factory, $1,000,000.

England, Liverpool—A. E. Sherman, archt., 17 North Johns St., department store for John Robin Ltd., to Tyson Ltd., Dryden St., Liverpool. $1,000,000.

Holland, Hillegam — G. Schoetau, Stationsweg 176, in market for regular supplies of Insulating Board.

Ireland, Cork—J. R. Boyd, Barrett, archt., 61 South Wall St., preparing plans for municipal home construction. $798,000.

Italy, Trieste—Aquila Co., constructing petroleum refinery capable of dealing with 300,000 tons raw oil yearly, to Reinmetall Borsig Wks., Dusseldorf, Germany, $1,500,000.

Japan, Kobe—Japan Steel Mfg. Co. in market for scrap materials.

Japan, Tokyo—Government votes 5,160,000 yen and Ministry of Communications plans 3 kilom steel arch bridge, 22 m. wide over Yadogawa, at Osaka.

Malta, Valetta—Colonial Government voted $500,000 for new power plant construction.

Mexico, Sonora—Mexican Federal Government, c/o National Irrigation Comn., constructing dam and irrigation project on Yaqui River, for impounding 1,640,000 cu.yd. water to irrigate more than 700,000 acres land. Part of work by day labor and part under contract. $15,000,000, Jose Valenzuela & Associates, Mexico City, c/o owner, engr.

Mexico, Tampico—Petroleos de Mexico S. A. (Petromex), Tampico, plans constructing 2 coil selective oil cracking unit (1,100 bbl. daily capacity), oil refinery. Universal Oil Products Co., 30 Rockefeller Plaza, New York, engr.

New Zealand—Aug. 11, for Secretary Public Works Supplies & Tenders Com., **Wellington,** supplying seven 110 kw. oil immersed circuit breakers, complete with accessories•••July 28, by Director General Stores Department, Posts & Telegraph, **Wellington,** supplying 80 mi. wire, jumper, twin, enameled, wool covered and flame protected•••Johns Burns & Co. Ltd., Custom St., **Auckland,** in market for supply of gasoline air-cooled engines up to 2 hp.

New Zealand, New Plymouth—New Plymouth Harbor Comrs., Motruoa, Newton King Wharf, takes bids until Aug. 27, supplying portal traveling crane, 2 ton, electric, level luffing, complete with spare parts.

Scotland — Chinese Government Purchasing Commission, London, England, mechanical equipment for control weir for Huai River Commissioners, for supplying and erecting 60 ft. sets of free roller sluice gates each 10 in. span by 5.5 m. deep and 2 oil engine auxiliary gear units, **Kilmarnock,** to Glenfield & Kennedy••• Keith & Co., Ltd., **Edinburgh,** in market for horizontal steel vulcanizer, 62 in. inside diam. by 6 ft. long for 90 lb. steam working pressure per square in.•••**Falkirk** Boro Council voted $1,215,000 for constructing 680 houses on Grangemouth Rd.•••D. and J. R. McMillian, archts, 105 Crown St., Aberdeen, listing names of intending bidders for constructing isolation hospital for Kincardine County Council. **Stonehaven•••Aberdeen** Municipality plans housing development on 632 acres, at Kincarth, $5,000,000•••**Calder** County Council, Midlothian voted $668,000 for 335 houses•••**Lasswade** County Council, Midlothian, voted $710,000 for 364 houses•••**Dunbarton** County Council, Dunbartonshire, voted $2,364,000 for home construction.

Soviet Russia—Soviet Government, c/o Amtorg Trading Corp., 265 5th Ave., New York, making plans constructing workers housing projects, in various locations. $200,000,000. Private plans.

South Africa, Durban—A. Blaikie & Co. Ltd., P. O. Box 1794, in market for regular supplies of Insulating Board.

Wales—County Council voted $503,250 for constructing county building. **Carmarthen•••**I. H. Heath, engr., **Swansea,** preparing plans constructing 2,000 houses, 100 ft. wide roads, car park, bus station, fire headquarters and public swimming bath, for municipality, $5,000,000.

Wales—Monmouthshire County Council, receives grant of $11,350,000 toward construction of $15,000,000 bridge subject to approval of Ministry of Transport. Mott, Hay & Anderson, Westminster, London, engrs.

Wales, Cardiff—Municipality voted $1,500,000 for exhibition hall. S. Clough, 78 Strand, W.C. London, England, archt., preparing plans.

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Wales, Cardiff—Thomas Owen & Co. Ltd., purchased site and making plans paper mill. $750,000. Plans ready in July.

PUBLIC BUILDINGS

PROPOSED WORK

†Ala., Fort Payne—Treas. Dpt. at office Sup. Archt., Wash., D. C., rejected bids June 1, constructing U. S. Post Office. Will readvertise. Noted June 8, C. D.—May 14, E. N.-R.

Calif., Los Angeles—Los Angeles Bd. Educ., Chamber of Commerce Bldg., plans by A. S. Nibecker, Jr., 1425 South San Pedro Ave., school plant, 2649 South Vermont Ave. $145,000. Architectural section of Bd. Educ. has completed preliminary plans and has been authorized to proceed with working drawings and specifications for same.

Calif., Redding—City plans by Masten & Hurd, 233 Post St., San Francisco, municipal auditorium. $200,000. Plans application to P.W.A. for loan and grant. Noted Sept. 18, C. D.—Sept. 26, E. N.-R.

★ **Calif., San Jose**—San Jose City School Dist., W. L. Bachrodt, city supt. schools, plans bond election to finance construction Senior High School, Phelan Tract. $1,250,000. Will seek W.P.A. aid in financing. Architect not appointed.

Calif., San Francisco—City and San Francisco Co., plans by C. H. Sawyer, City Hall, ch. of Municipal Bureau of Architecture, for Junior College, Balboa Park, $300,000.

Conn., Greenwich — Bd. Educ., Town Hall, plans by J. W. Bailey, Putnam Bldg., brick, steel, stone fire station. Bids late in August. $140,000. Noted Mar. 11, C. D.—Mar. 19, E. N.-R.

Conn., Southington — Southington Hospital Corp., E. S. Todd, pres., plans by Lester Beach Scheide, Inc., 100 Pearl St., Hartford, brick, stone hospital, Meriden Ave. and Oakland Rd. $150,000. Julia A. Bradley Trust Fund. **Plan September maturity.** Noted Feb. 13, C. D.—Feb. 20, E. N.-R.

Idaho, Moscow—University of Idaho, c/o F. Stanton, sketches by Whitehouse & Price, Hutton Bldg., Spokane, Wash., men's dormitory, $210,000. P. Maloney, Hutton Bldg., Spokane, Wash., structural engr.

Ill., Joliet—Dpt. P. Wks. & Buildings, Div. Architecture & Eng., Springfield, plans by C. H. Hammond, state superv. archt., Capitol Bldg., Springfield, constructing prison, near here. $460,000.

Ill., Pontiac—Dpt. P. Wks. & Buildings, Div. Architecture & Eng., Springfield, plans by C. H. Hammond, state superv. archt., Capitol, Springfield, constructing prison. $430,000.

Ia., Alta—City authorized $75,000 bonds for remodeling electric light plant and adding Diesel units to steam plant.

Ia., Elkador—Bd. Educ. plans high school. Est. about $140,000. Architect not appointed.

★ **Ia., Iowa City**—District Supreme Court denied injunction filed by private utility against constructing light plant by City. $915,000. Burns & McDonnell Eng. Co., 107 West Linwood Blvd., Kansas City, engrs. Noted Dec. 9, C. D.—Dec. 12, E. N.-R.

★ **Ia., Sioux City**—Election July 1, for $750,000 for constructing civic auditorium.

★ **Md., College Park**—University of Maryland Institute of Transport, plans by H. W. Cutler, 1108 16th St. N. W., Wash., D. C., 2 story, basement administration building, Campus. $500,000. Noted Feb. 19 C. D.—Feb. 28, E. N.-R.

Mich., Jackson—State Prison Bd. set aside an additional $95,000 for construction of new twine plant at State Prison. $75,300 already appropriated.

Mo., Cape Girardeau—Cape Girardeau Public Schools, c/o Bd. Educ., B. H. Smith, pres., election June 23, $85,000 bonds, constructing brick, concrete, stone schools $130,000-$156,000. W. B. Ittner, Inc., 408 Bd. Educ. Bldg., St. Louis, archt. P.W.A. project. Noted Sept. 19, C. D.—Sept. 26, E. N.-R.

Mo., Columbia—City final plans in progress improving power plant, 750 hp. boiler, 400 lb. pressure, 5,000 kva. turbine condenser, etc. $280,000. Burns & McDonnell Eng. Co., 107 West Linwood Blvd., Kansas City, engrs.

Mo., Fulton—Bd. Educ. voted $146,000 bonds and soon takes bids for constructing brick, stone school. Felt, Dunham & Kriehn, Mill Creek Bldg., Kansas City, archts. Noted May 27, C. D.—June 4, E. N.-R.

Mo., Koch—City, Bd. P. Serv., City Hall, St. Louis, soon takes bids constructing 4th ward building, 3 story, basement, rein.-con., brick, Robert Koch Hospital. $300,000. P.W.A. project. A. Osburg, city archt. E. C. Becker, city engr.

Mo., Plattsburg—City plans light plant. $85,000. E. T. Archer & Co., 609 New England Bldg., Kansas City, archts.

★ **Mo., St. Louis** — City, Bd. P. Serv., City Hall, superstructure for 2 story, basement 265x380 ft. rein.-con., brick, steel, national guard armory, Market St. between Spring and Prospect Aves. $1,347,000. A. Osburg, city archt. W. C. E. Becker, city engr.

N. J., Dover—Bd. Educ., plans by Campbell & Voorhees, 16 Schuyler Pl., Morristown, fireproof high school. $230,000.

N. M., Albuquerque—Albuquerque Bd. Educ., c/o clerk, sketches by L. G. Hesselden, archt., Albuquerque, new gymnasium for high school. $175,000. P.W.A. project.

N. Y., Bethany—Bd. Supervs. Genesee Co., Batavia, plans completed by F. Homelius, 35 Richmond Ave., Batavia, and bids probably in summer, constructing county home. $400,000. Noted Oct. 18, C. D.—Oct. 24, E. N.-R.

N. Y., Brocton—Village Bd. Trustees, plans rehabilitation of former municipal power plant in Highland Ave., incl. installing diesel engines and other equipment.

N. Y., Dundee—Bd. Educ. plans large centralized school. To exceed $140,000. P.W.A. grant in amount of 45% has been applied for. R. R. Graham, Middletown, archt.

N. Y., Groton—Town plans constructing hydro-electric plant. $350,000. P.W.A. funds applied for. H. Whitman, 110 West Buffalo St., Ithaca, engr.

★ **N. Y., Huntington**—Union School Dist. No. 1 voted to appropriate $550,000 for constructing Junior High School at Nassau Ave. and Woodhull St.; also $25,000 for heating and ventilating plant in Main Street Elementary School. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., Jamestown—Bd. P. Utilities, C. O. Johnson, supt., City Hall retained J. G. White Eng. Corp., engrs., 80 Broad St., New York, to prepare plans and specifications for installing 12,500 kw. minimum turbo-generator at Steele St. Municipal Light Plant. $475,000. (**Correction**—Engineers). Noted June 3, C. D.—June 11, E. N.-R.

N. Y., New York—Dpt. Hospitals, 125 Worth St., soon takes bids constructing 5 story, 177x205 ft. hospital Lenox Ave. and 136th St. $450,000. J. Lustig, c/o owner, archt.

N. Y., Plattsburg—Library Bd. plans constructing large library at Oak and Brinkerhoff Sts. Architect and engineer not appointed.

★ **N. Y., Poughkeepsie**—Bd. Educ., 22 Washington St., bids in fall, constructing school, Hamilton St. $575,000. J. P. Draney, 49 Market St., Poughkeepsie, archt.

N. Y., Syracuse—Central New York Regional Market Authority, 525 Union Bldg., indefinitely postponed bids to have been opened June 12, constructing regional market at Hiawatha Blvd. and Park St. P.W.A. project. Bids June 12. Noted June 4, C. D.

N. Y., Tupper Lake — Village, G. Bisson, supt. Municipal Power Plant, will purchase electrical equipment, voltage regulator, transformers, potential transformers, conduit risers, output switches, cut-outs, etc., for light plant. To exceed $1,000.

N. Y., Utica—City, City Hall, plans fire station, 13th Ward. To exceed $140,000, incl. equipment. Will apply for P.W.A. funds. J. B. Shaw, city engr.

N. Y., Wellsville—Bd. Educ. plans constructing school, State St. To exceed $140,000. Architect and engineer not appointed.

★ **†N. Y., West Point**—Con. Q. M., Military Academy, rejected bids June 3, constructing 19 double sets junior officers' quarters, 12 family apartment and two 3 row quarters, $810,000. Will readvertise. Noted May 7, C. D.—May 14, E. N.-R.

N. C., Rockingham — Rockingham Co. Bd. Educ., Wentworth, J. E. McLean, supt., J. L. Roberts, Madison, chn., filed application with P.W.A. for loan and grant to finance construction of school buildings. Est. $349,090.

N. C., Washington—Beaufort Co. Bd. Educ., C. F. Cowell, chn. Bd., filed application with P.W.A. for loan to finance construction of school buildings in county. $263,636. F. A. Edmondson, Washington, supt. schools.

O., Clyde—Municipality plans electric light and power plant improvements. $60,000. W. C. Kammerer, 823 Prospect Ave., Cleveland, archt.

Okla., Claremore—City made preliminary plans installing 750 hp. Diesel engine and generator in light plant. $60,000. B. Sprankle, Claremore, engr.

S. D., Sisseton—Bd. Educ., plans by Hugill & Blatherwick, archt., 367 Boyce-Greeley Bldg., Sioux Falls, rebuilding 2 story, basement, 140x190 ft., brick, stone, fireproof school. $180,000. Noted June 4, C. D.—June 11, E. N.-R.

Tenn., Memphis—City, E. C. Ball, supt. Schools, plans by E. W. Mann, addition to negro school, Manassas St., $13,000; plans by Regan & Weller, Commerce Title Bldg., 24 classroom addition to Melrose Negro School, $153,000; plans by A. F. Hansen, Columbian Mutual Tower Bldg., 12 classroom new building at La Rose; plans by J. T. Wallace, Com-

Public Buildings (Continued)

merce Title Bldg., 8 classroom addition to Wolfintine School, plans by G. Awsumb, new gymnasium at South Side High School and at Humes High School. Applications filed with P.W.A. officials for loans, to finance above improvements.

Tex., Port Isabel — Port Isabel-San Benito Navigation Dist., Cameron Co., c/o J. Q. Louthan, genl. mgr., Alaska Bldg., San Benito, soon takes competitive bids steel, concrete precooling plant, cork insulation, mechanical equipment, corrugated asbestos roof, steel sash, etc. A. J. Authenrieth, 1071 Marquette Bldg., engr. and archt. J. Marriott, Frost Bldg., San Antonio, assoc. archt. Noted May 7, C. D.—May 14, E. N.-R.

★**Tex., Temple**—City plans bond election to finance construction of complete municipal electric light and power plant, incl. four 1,200 hp. Diesel engines, 50x120 ft., brick plant, power transmission lines, lights, and machinery and equipment for complete plant. Est. $800,000. Garrett Eng. Co., Temple, and 300 Hughes St., Houston, engrs. Noted Oct. 2, C. D.—Oct. 10, E. N.-R.

B. C., Vancouver—British Columbia Electric Ry. Co., 425 Carroll St., making plans and takes bids about July 15, underground ducts for two 12,000 volt circuits. $200,000. A. Vilstrup, M.A.I.E.E., 425 Carroll St., engr.

B. C., Vancouver—British Columbia Electric Ry. Co., 425 Carroll St., plans by McCarter & Narnne, Marine Bldg., rein.-con., steel electric power substation, plain found., East End, $85,000; also equipment 12,000 to 34,000 volts, $250,000. **Maturity about 2 months.** A. Vilstrup, 425 Carroll St., engr.

★**Man., Winnipeg**—Dr. George F. Stephens, medical supt. Hospitals, submits plans for increased hospital accommodations, $985,000. Contingent upon Dominion Govt. grant.

Newfoundland—Dpt. P. Wks., St. Johns, making plans constructing hospital at St. George, constructing police barracks at St. Johns and Ranger Barracks at Whithorse.

Ont., Ottawa—Ottawa Separate School Bd., E. C. Desormeau, secy., plans by L. Leblaue, Bank National Bldg., 17 room St. Jean Baptiste school; plans by H. J. Morin, Bank National Bldg., 4 room school. Rideau Ward: plans by J. L. LeFort, Ottawa, alterations to Guigues School. Noted May 19, C. D.

BIDS ASKED

†**Ariz., Sasabe**—July 22, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $17,000. Noted Mar. 10, C. D.—Mar. 12, E. N.-R.

†**Calif., Santa Clara**—July 14, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing exterior changes in U. S. Post Office.

†**Colo., Delta**—July 2 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. Noted May 14, C. D.—May 21, E. N.-R.

†**Conn., Winsted**—July 17, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. $111,000. Noted Oct. 21, C. D.—Oct. 24, E. N.-R.

†**Ga., LaFayette**—July 15, by Treas. Dpt. at office Sup. Arct., Wash., D. C., constructing U. S. Post Office. $60,000.

†**Ia., Manchester**—Treas. Dpt. at office Sup. Archt., Wash., D. C., bids about July 1, constructing U. S. Post Office.

†**La., Alexandria**—July 14, by Veterans Bureau, Arlington Bldg., Wash., D. C., constructing addition to Administration Building No. 1. Noted Jan. 23, C. D.—Jan. 30, E. N.-R.

Md., Baltimore—July 8, by Bd. Awards, 2 story, basement addition to museum of art, on Wyman Parkway. $450,000. P.W.A. project. John Russell Pope, 542—5th Ave., New York, archt.

Mass., Taunton—July 1, by Commonwealth of Massachusetts, Dpt. Mental Diseases, State House, Boston, lighting fixtures and lamps for hospital and infirmary buildings at State Hospital. P.W.A. project. Kendall, Taylor & Co., 209 Columbus Ave., Boston, archts.

†**Mich., Detroit**—July 10, by Treas. Dpt. at office Sup. Archt., Wash., D. C., altering main building U. S. M.D.

†**Mich., Ferndale**—July 3, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing 2 story, basement, brick, steel post office, plain found. $150,000. Noted June 9, C. D.—June 11, E. N.-R.

Mo., Fulton—July 10, by State Hospital 1, Fulton and Bi-Partisan Advisory Bd. State Building Comn., E. M. Eagan, executive secy., Jefferson City, constructing 3 story, basement, 32x40x42x368 ft. Y-shaped, rein.-con., brick psychiatric clinic building and 5 story, basement, 112x43 ft., rein.-con., brick hospital. $367,000. P.W.A. project. P. J. Bradshaw, 718 Locust St., St. Louis, archt. Noted Jan. 3, C. D.—Jan. 9, E. N.-R.

†*Federal Government*

†**Mo., Monett**—July 20, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. $70,000.

Mo., St. Louis—July 8, by Bd. Educ., 911 Locust St., constructing 3 story, 64 x 187 ft. Garfield Grade School, 2612 Wyoming St. G. W. Sanger, 911 Locust St., engr. and archt. P.W.A. project. Noted June 10, C. D.—June 18, E. N.-R.

Mont., Helena—See "Contracts Awarded."

†**Mont., Raymond**—July 15, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $17,000.

†**Mont., Scobey**—July 15, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $16,500.

†**Neb., Lincoln**—July 14, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing elevator and remodeling U. S. Post Office and Court House.

†**Neb., Omaha**—July 15, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing miscellaneous interior changes in Federal Office Building.

†**N. H., Portsmouth**—July 7, by Treas. Dpt at office Sup. Archt., Wash., D. C., constructing entrance changes in U. S. Court House and Post Office.

†**N. J., Lakewood**—July 17, by U. S. Eng., Sup. Archt., Wash., D. C., constructing U. S. Post Office. $100,000. Noted Feb. 19, C. D.—Feb. 27, E. N.-R.

†**N. J., South Orange**—July 16, by Treas. Dpt., at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. $133,000. Noted Feb. 19, C. D.—Feb. 27, E. N.-R.

N. J., Trenton—July 8, by S. H. Barlow, Quartermaster General, State House, altering and constructing additions to National Guard Armories at Trenton and Red Bank. $200,000. W. H. Kelly, Jersey City, archt.

N. M., Albuquerque—July 9, by Bd. Regents University of New Mexico, constructing student union on campus. P.W.A. project. J. G. Meem, Santa Fe, archt.

N. Y., Catskill—Memorial Hospital of Greene County, 120 Broad St., Catskill, taking bids constructing hospital, Jefferson Heights. G. E. Lowe, 286 Wall St., Kingston, archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., New York—See "Contracts Awarded."

N. Y., Warsaw—See "Contracts Awarded."

†**N. C., Anderson**—July 1, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office.

†**N. D., Noonan**—Treas. Dpt., Wash., D. C., taking bids constructing U. S. Inspection Station. $17,000.

†**N. D., Westhope**—July 16, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $17,000.

Okla., Strand—Mayor and City Council will purchase 1 diesel engine and 300-400 hp. generator.

†**Pa., Beaver Falls**—July 15, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. $225,000.

†**Pa., Somerset**—July 21, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. $90,000.

†**Tex., Fort Worth**—July 16, (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Narcotic Farms building. Noted June 1, C. D.—May 21, E. N.-R.

Tex., Fort Worth—July 3, by Bd. Educ., c/o E. P. Williams, bus. mgr., 409 East Weatherford St., rehabilitating 3 story, brick, concrete school, construct new 3 story, brick, concrete addition, 1st story, concrete extension walls, 2nd and 3rd stories face brick on concrete frame, etc. $280,000. C. H. Woodruff, 1929 Hurley St., archt.

†**Vt., Albury Springs**—July 16, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $17,500. Noted June 17, C. D.—June 25, E. N.-R.

†**Vt., Beebe** — July 17, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $25,000. Noted Mar. 30, C. D.—Apr. 2, E. N.-R.

†**Wash., Ferry**—July 15, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Inspection Station. $17,000.

Wis., Elkhorn—July 1, by Walworth Co., 2 story, basement, 35x116 ft., brick, steel addition to asylum for insane, plain found. H. J. Van Ryn, 152 West Wisconsin Ave., archt.

Wis., Milwaukee—July 2, by Dpt. P. Wks., constructing Dist. 3 Police Station, 2 story, basement, 116x139 ft., brick, steel, North 47th St. $147,000. R. E. Stoelting, City Hall, engr.

†**Alaska, Nome**—July 20, by Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office. $425,000.

LOW BIDDERS

★†**Mass., Boston** — P. Wks. Administration, Div. Housing, Wash., D. C., June 17, constructing superstructures of Old Harbor Village Housing Project, Project H-3302, from Matthew Cummings Co., 43 Tremont St., $4,991,000. Noted June 1, C. D.—June 4, E. N.-R.

★†**N. Y., Buffalo** — P. W. Administration, Div. Housing, Wash., D. C., June 12, constructing superstructures of Kenfield Housing Project, Project H-6703, from Fleischer Eng. Co., 600 Minnesota Bldg., St. Paul, Minn., $4,050,000. Noted June 15, C. D.—June 18, E. N.-R.

CONTRACTS AWARDED

Ala., Ozark—City Council, at office H. L. Dowling, city clk., complete Butane-air gas plant and distribution system, to A. Blair, 1st Natl. Bank Bldg., Montgomery. $44,591. Bids June 11. Noted June 5, C. D.

†**Calif., San Francisco**—A. Fourehy, assoc. civil engr., 219 Administration Bldg., Government Island, Oakland, reconstructing crew's quarters, incl. new boiler, heating plant, floors, etc., at Fort Point, to H. Pinkerton, 927 Howard St., $3,535. Noted June 12, C. D.

Calif., Camarillo—State Div. of Architecture, P. Wks. Bldg., Sacramento, general contract addition of units 12 and 13, comprising dining room and hall additions and 1 story industrial building, all rein.-con. construction at hospital, to Los Angeles Contg. Co., and W. G. Wopschall, 4816 West Pico Bldg., Los Angeles, $112,465 •••heating, ventilating and plumbing, to Scott Co., 243 Minna St., San Francisco, $8,678 and $15,387 respectively•••electrical work, to Seaside Electric Co., 97 South Oak St., Ventura, $7,255. Grand total $143,785. Bids June 9. Noted May 21, C. D.—May 28, E. N.-R.

Calif., Los Angeles—Los Angeles Bd. Educ., Chamber of Commerce Bldg., painting and miscellaneous work at administration building, home economics, industrial arts at San Pedro High School, 1221 South Gaffey St., to H. Wasserman, 424 North Crescent Heights Bldg., $2,750; awarded June 8; work at main building at Logan St. School 1411, to Raphael Co., 270 Tehama St., San Francisco, $2,749, awarded June 4.

Calif., Los Angeles—Regents of University, Los Angeles, heating and ventilating of administration building to B. K. Stoneman, 130 East 81st St., $52,000. Awarded June 11.

Conn., Milford—J. Zandonella, general contractor, East Thorne St., Bridgeport, reinforcing steel for police court, town hall addition, River St., to Truscon Steel Co., 42 Church St., New Haven, for Town, H. M. Merwin, first selectman•••plumbing and heating to W. Roe, 2626 Main St., Bridgeport•••waterproofing, roofing to Barrett Roofing & Supply Co., 1696 Stratford Ave., Bridgeport•••structural steel, to New England Wks., 1331 Dixwell Ave., Hamden•••iron, to Adelhurst Iron Co., 52 Richards St., West Haven•••mill finish, to A. W. Burritt Co., Knowlton St., Bridgeport•••painting, to David H. MacKenzie, Inc., 391 Lincoln Ave., Bridgeport•••limestone, to Brennan & Shea, Inc., 208 Housatonic Ave., Bridgeport••• brick, lumber to Frank Miller Lumber Co., 125 East Wash. Ave., Bridgeport•••marble and tile, to Earle B. Warner, Inc., 25 Garden St., New Haven•••mixed cement, to Bridgeport Concrete Co., 1121 Seaview Ave., Bridgeport•••tile, to Hartford Cement Co., 51 Homestead Ave. Noted May 11, C. D.—May 14, E. N.-R., under "Contracts Awarded."

★†**Conn., Stamford**—P. Wks. Administration, Div. Housing, Wash., D. C., constructing superstructure for Fairfield Court Housing Project H-9601, to Lane Ogle, Inc., 205 East 42nd St., New York, $690,956. Bids May 26. Noted June 1, C. D.—Apr. 30, E. N.-R.

†**D. C., Wash.**—Treas. Dpt. at office Sup. Archt., Wash., D. C., metal library bookstacks, book lift, etc., to Art Metal Constr. Co., Jamestown, N. Y., $113,440.

†**D. C., Wash.**—John McShain, general contractor, 1610 North St., Phila., Pa., 1,300 tons structural steel for building for Bureau of Engraving and Printing for Treas. Dpt. at office Sup. Archt., Wash., D. C., to Bethlehem Steel Co., Bethlehem, Pa. Contractor will soon purchase 500 tons sheet steel piling. Noted June 10, C. D.—June 18, E. N.-R.

†**D. C., Wash.**—P. Wks. Administration, Div. Housing, Wash., D. C., filling and rough grading for Langston Housing Project, Project H-1706-A, to Logan Pingree Co., Inc., 3820 Garfield St., N.W., $17,615. Bids June 5. Noted June 9, C. D.

†**D. C., Wash.**—James Stewart & Co., general contractors, 230 Park Ave., New York, 1,200 tons structural steel for building for Home Owners Loan Corp., Pennsylvania Ave. and 12th St., to Bethlehem Steel Co., Bethlehem, Pa. Noted May 29, C. D.—June 4, E. N.-R., under "Contracts Awarded."

†**Fla., Madison**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post

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Public Buildings (Continued)

Office, to J. M. Raymond Constr. Co., 710 Atlantic Natl. Bldg., Jacksonville. $48,000. Bids May 12. Noted May 14, C. D.—Apr. 23, E. N.-R.

★†**Fla., Jacksonville** — P. Wks. Administration, Div. Housing, Wash., D. C., constructing superstructures of Durkeeville Housing Project H-4702, to H. S. Baird, Inc., Atlantic Natl. Bank Bldg., $850,317. Bids June 2. Noted June 8, C. D.—Apr. 30, E. N.-R.

†**Fla., West Palm Beach**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to A. F. Blair, Petersburg, Va., $179,871. Bids June 11. Noted June 16, C. D. —May 14, E. N.-R.

Ga., Athens—University of Georgia, Dr. Caldwell, pres., constructing boys' dormitory to C. O. Smith, Hazelhurst, $44,917•••girls' dormitory, to J. K. Davis & Sons, Athens, $96,860••• agricultural building, to Potter & Shackelford, Inc., Greenville, S. C., $80,048. Grand total $221,825. **P.W.A.** Bids June 5. Noted May 15, C. D.—May 21, E. N.-R.

Ga., Gainesville—Hall Co. Bd. Comn., c/o R. G. McConnell, chn., 2 story, basement, 60x110 ft. court house, to C. Mion, Bona Allen Bldg., Atlanta, $155,787. **P.W.A.** Noted June 18, C. D.—June 25, E. N.-R.

†**Ga., Monticello**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Batson Cooke Co., West Point, $48,400. Bids May 27. Noted June 11, C. D.—May 7, E. N.-R.

†**Ill., Bushnell**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to C. Westburg, 6234 South Oakley Ave., Chicago, $47,184. Bids May 12. Noted May 20, C. D.—Apr. 23, E. N.-R.

†**Ill., Dwight** — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing 1 story, rein.-con., brick, stone U. S. Post Office, to J. C. Miller, Campbellsville, Ky., $46,464. Bids May 18. Noted May 21, C. D.—Apr. 30, E. N.-R.

†**Ia., Leon**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Weitz Co., 713 Mulberry St., Des Moines, $55,500. Bids June 2. Noted June 9, C. D.— May 14, E. N.-R.

†**La., Leesville**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to R. P. Farnsworth Co., 212 Nashville Ave., New Orleans, $49,399. Noted June 16, C. D.

†**Mass., Bedford**—T. O'Connor & Co., general contractors, 238 Main St., Cambridge, excavation for buildings and utilities for Neuro Psychiatric Ward for Vet. Bureau, Arlington Bldg. Wash., D. C., to Marrinucci Bros. Co., 51 Ceylon St., Dorchester. Noted June 4, C. D. —June 11. E. N.-R., under "Contracts Awarded."

†**Mass., Boston**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing miscellaneous changes in appraisers' stores, to Vanguard Constr. Co., 11 West 42nd St., New York, N. Y., $50,000. Noted June 2, C. D.—June 4, E. N.-R.

Mass., Greenfield—Town, W. H. Hawks, chn. Building Comn., Town Hall, furnishing, installing fire alarm system in new fire station, to L. W. Bills, 73 Hancock St., Lexington, $11,804. **P.W.A.** Bids Apr. 22, awarded June 2. Noted Apr. 20, C. D.

Mass., Winthrop—H. W. Hanson, general contractor, 115 Chauncy St., Boston, structural steel for construction of alterations and addition to Shirley St. Grade School, to Consolidated Iron Wks., 323 Commercial St., Malden, for Town, Supt. of Schools•••heating, to Florence & Co., 79 Sudbury St., Boston•••waterproofing, to National Waterproofing Co., 1079 Columbus St., Roxbury•••cast stone, to Stephen Bianchi & Co., 338 Copeland St., Quincy•••electrical work, to James Wilkinson & Co., 128 Oliver St., Boston•••metal foundation, to Knapp Bros. Mfg. Co., 270 Cedar St., Somerville•••painting, to H. Newton Marshall Co., 522 Harrison Ave., Boston•••plumbing, to W. N. McKenna Co., 79 Chestnut St., Boston. **P.W.A.** Noted June 5, C. D.—June 11, E. N.-R., under "Contracts Awarded."

Mich., Gaylord — State Administrative Bd., hospital group, general contract, to Martin Krausmann Co., 955 East Jefferson St., Detroit, $744,786•••plumbing and heating, to Lansing Heating & Ventilating Co., Lansing, $92,611 •••electrical work, to Hall Electric Co., Muskegon, $21,408. Grand total $358,805. Bids May 12. Noted May 25, C. D.—Apr. 23, E. N.-R.

Minn., St. Paul—City, Dpt. Educ., City Hall, 2 story, basement, 150x150 ft., school, and 50x 240 ft. auditorium, brick, cut stone, on 747 Jenks St., to Lindstrom & Anderson, 705 Minnesota Mutual Life Bldg., $238,640. **P.W.A.** Work started. Bids Apr. 21. Noted May 1, C. D.—May 7, E. N.-R.

Mo., Farmington—State Hospital 4 and Bi-Partisan Advisory Bd. of State Building Comn., Jefferson City, general contract 5 cottages and dining hall addition, to McCarthy Bros. Constr. Co., $4903 Delmar Blvd., St. Louis, $289,460 and $55,445 respectively•••plumbing, to E. J. Fisher, 4134 Westminster Pl., St. Louis, $33,215 •••electrical work, to E. P. Allison Co., Inc., 317 North 11th St., St. Louis, $14,647. Grand total $392,767. **P.W.A.** Bids June 2. Noted June 11, C. D.—May 14, E. N.-R.

Mo., Fulton—State Building Comn., Capitol Bldg., Jefferson City, general contract 1 story, 78x122 ft., rein.-con., brick, steel power plant at State Hospital, to Simon Constr. Co., Columbia, $113,396. **P.W.A.** Bids May 29. Noted June 8, C. D.

Mo., Mount Vernon—State Sanitorium, Mount Vernon and Bi-Partisan Advisory Bd. State Building Comn., E. M. Eagan, executive secy., Jefferson City, general contract 4 story, basement, administration and medical center and infirmary building, to Peterson Constr. Co., Finance Bldg., Kansas City, $351,726 base bid •••heating, ventilating, refrigeration, and plumbing, to Industrial Plumbing & Heating Co., St. Joseph, $109,260 base bid•••electrical wiring, to E. O. Dorsch Electric Co., 2011 Olive St., St. Louis, $20,953 base bid. **P.W.A.** Bids May 26. Noted June 9, C. D.—May 14, E. N.-R.

Mo., Thayer—City, F. Crenshaw, clk., constructing light and power plant, to Fairbanks, Morse & Co., 217 South 8th St., St. Louis, $65,032. **P.W.A.** Bids June 10. Noted May 25, C. D.—May 28, E. N.-R.

Mont., Helena—Helena School Dist. 1, J. E. McBride, clk., repairing school buildings, force account, $175,000. R. C. Hugenin & N. De Kay, Helena, archts. O. G. Bowen, 1144 South Grand St., Los Angeles, Calif., consult. engr.

†**N. H., Wolfeboro**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Loucke & Clarke Corp., Wallingford, Pa., $50,996. Bids Apr. 24. Noted Apr. 28, C. D.—Apr. 2, E. N.-R.

N. Y., Binghamton—W. A. Berbusse, Jr., general contractor, 101 Park Ave., New York, concrete work for school, Howard Ave., for City, City Hall, to R. L. Glover, 63 Adams St., Garden City. Noted June 1, C. D.—June 4, E. N.-R., under "Contracts Awarded."

N. Y., Brooklyn — Adjutant General, Div. Military & Naval Affairs, State Capitol Bldg., Albany, heating work for 106th Infantry Armory, to T. F. Egan Refractory Eng. Co., 70 Kane St., $40,926. Bids May 29. Noted June 4, C. D.

†**N. Y., Canandaigua**—Erwin & Leighton, general contractors, Schaff Bldg., Phila., Pa., brick work for additional building at U. S. Veterans Hospital, Arlington Bldg., Wash., D. C., to C. O. Struse & Sons, 4002 Ridge Ave., Phila., Pa.•••reinforcing steel, to Buffalo Steel Co., Fillmore Ave., Tonawanda•••miscellaneous iron, to Ornamental Iron Wks., 929 Sweitzer St., Akron, O. Noted Apr. 24, C. D.—Apr. 30, E. N.-R.

N. Y., Catskill—C. B. Saxon, Inc., general contractors, 35 West 45th St., New York, structural steel for school, for Bd. Educ., to Belmont Iron Wks., 44 Whitehall St., New York. **P.W.A.** Noted Apr. 29, C. D.—May 7, E. N.-R., under "Contracts Awarded."

N. Y., Dansville—A. Friederich & Sons, general contractors, 710 Lake Ave., Rochester, reinforcing steel for school, School St., for Bd. Educ. School Dist. 1, to F. L. Heughes & Co., 1029 Lyell Ave., Rochester•••cast stone, to Rochester Cast Stone Co., 1965 East Ave., Rochester•••terrazzo, to Italian Mosaic Marble & Tile Co., 1085 East Delavan Ave., Buffalo. Noted Apr. 24, C. D.—Apr. 30, E. N.-R., under "Contracts Awarded."

N. Y., Dryden—Central School Dist. 1, general contract school, James Union St., to J. Dall, Jr., Inc., Seneca Bldg., Ithaca. Est. $305.-000. **P.W.A.** Bids June 5. Noted June 9, C. D.—June 4, E. N.-R.

N. Y., Dryden—Central School Dist. 1, plumbing for school, to R. E. Lewis, 60 Lincoln Ave., Cortland•••heating, to Warnock & Zahrnd, 742 South Clinton Ave., Rochester••• electrical work, to M. M. Gleason, 239 Water St., Binghamton. **P.W.A.** Bids June 5. Noted June 17. C. D.—June 25, E. N.-R., under "Contracts Awarded."

N. Y., Goshen—Bowe Constr. Co., Inc., general contractors, 44 11th St., Long Island City, structural steel for county welfare home for Bd. Supervs. Orange Co., County Bldg., to Voepel Sons, Inc., 2353 Charton Ave., New York•••limestone, to Wyoming Stone Co., Scranton, Pa.•••millwork, to Lumb Woodworking Co., Inc., 61 Main St., Poughkeepsie. Noted Apr. 30. C. D.—May 7, E. N.-R., under "Contracts Awarded."

N. Y., Gouverneur—E. C. Richards & Son, general contractors, 2220 Douglas Crescent, Utica, reinforcing steel for school, for Union Free School Dist. 1, Gouverneur, to Bethlehem Steel Co., Bethlehem, Pa. **P.W.A.** Noted June 8. C. D.—June 11, E. N.-R., under "Contracts Awarded."

N. Y., Johnson City—F. W. O'Connell, general contractor, 329 Water St., Binghamton, ornamental iron for school, for Bd. Educ., Johnson City, to Titchener Iron Wks., 22 [illegible] wold St., Binghamton•••millwork, to A. [illegible] son & Son, Wells Ave., Binghamton•••steel, to Onondaga Litholite Co., 102 North Beech St., Syracuse•••reinforcing steel, to Bethlehem [illegible] Co., Bethlehem, Pa. Noted May 4, C. D.— May 7, E. N.-R., under "Contracts Awarded."

N. Y., Newburgh—L. H. Swenson, Inc., general contractor, 2 Cannon St., Poughkeepsie, stone for regional market, Dickson St., for Lower Hudson Regional Market Authority, Congers, to Dextone Co., 166 Chapel St., New Haven, Conn.•••roofing, to A. Ratner & Co., East Orange, N. J.•••tile, to Schenectady Tile Co., 785½ State St., Schenectady. **P.W.A.** Noted Apr. 24, C. D.—Apr. 30, E. N.-R.

★†**N. Y., New York**—P. Wks. Administration, Housing Div., Wash., D. C., constructing Harlem River Housing Project, Project H-[illegible] to Caldwell Wingate Co., 101 Park Ave., $563,031. Bids May 27, Noted May 25, C. D.— June 4 E. N.-R.

N. Y., New York—Dpt. Parks, Arsenal Bldg., Central Park, constructing 89x188 ft. cafeteria on Randalls Island, relief labor, $150,000. **W.P.A.** Owner is purchasing material. A. [illegible] bury, 2nd. archt.

N. Y., Ogdensburg—Bd. Educ., electrical work for school, to F. Handlein, 1621 Belle[illegible] Ave., Syracuse. **P.W.A.** Noted May 26, C. D. —Apr. 16, E. N.-R.

N. Y., Poughkeepsie — Lower Hudson Regional Market Authority, Newburgh, general contract farmers market, Smith St., to Wininger & Selby, Inc., 152 West 42nd St., New York, $14,500; grading and fill, to Spoor-Lasher Co. Separate contracts awarded. **P.W.A.** Bids Apr. 22. Noted Apr. 14, C. D.—Apr. 16 E. N.-R.

N. Y., Prattsburg—A. Friederich & Sons, general contractors, 710 Lake Ave., Rochester, structural steel for school, for Bd. Educ., to F. L. Heughes & Co., 1029 Lyell Ave., Rochester; ornamental iron, to B. Heckerman Iron Wks., 1100 East Water St., Syracuse. **P.W.A.** Noted May 13, C. D.—May 21, E. N.-R., under "Contracts Awarded."

N. Y., Rushford—R. E. Williams & Sons, general contractors, 303 Grate St., Buffalo, reinforcing steel and steel joists for school, for Central School Dist. 1, to Bethlehem Steel Co., Bethlehem, Pa. **P.W.A.** Noted May 7, C. D. —May 14, E. N.-R.

N. Y., Sherman—J. M. Bentzinger, Inc., general contractors, Gokey Bldg., Jamestown, reinforcing steel and steel joists for school, for Bd. Educ. Central School Dist. 1, to Bethlehem Steel Co., Bethlehem, Pa. **P.W.A.** Noted May 13, C. D.—May 21, E. N.-R., under "Contracts Awarded."

N. Y., South Dayton—C. H. Wing Co., general contractors, 66 Allen St., Buffalo, structural steel for school, for Bd. Educ. Union Free School Dist. 9, to August Feine & Sons Co., 140 Terrace, Buffalo; reinforcing steel and steel joists, to Truscon Steel Co., Sidway Bldg., Buffalo. **P.W.A.** Noted June 8. C. D.—June 11 E. N.-R., under "Contracts Awarded."

N. Y., Spencer—J. M. Knowlton Co., general contractors, 201 Robinson St., Binghamton, roofing for school, for Central School Dist. 1, to Sullivan Bros. & Lent, Riley Pl., Binghamton•••marble and tile, to Stearns Bros. & Denin, 1407 East Erie Blvd., Syracuse•••millwork, to A. Roberson & Son, Wells Ave., Binghamton. **P.W.A.** Noted May 5. C. D.—May 7. E. N.-R., under "Contracts Awarded."

N. Y., Warsaw—Bd. Supervs. Wyoming Co., constructing brick, steel court house and county office building, plain found., own forces. Owner will purchase materials. Noted Mar. 17, C. D.—Mar. 19, E. N.-R.

N. Y., Warsaw—Bd. Supervs. Wyoming Co., Warsaw, constructing steel, masonry hospital, own forces. C. W. Eldridge, 27 East Bridge St., Oswego, archt. Bids late in June, on steel, masonry, materials, etc. Noted June 3, C. D. —June 11, E. N.-R.

N. Y., Windham — Central School Dist. 1, heating for school, to James Hunter Heating & Contg. Co., 68 Liberty St., Albany•••plumbing, to P. Rubenstein, 152 Madison Ave., Albany•••electrical work, to E. G. May, 51 Central Ave., Albany. **P.W.A.** Noted June 8. C. D.— June 11, E. N.-R., under "Contracts Awarded."

†**N. C., Lincolnton**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Bonded Constr. Co., 110 East 42nd St., New York, N. Y., $42,178. Bids Apr. 23. Noted Apr. 27, C. D.—Apr. 2, E. N.-R.

†**N. C., Marion**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to L. B. Gallimore, Greensboro, $64,950. Bids May 26. Noted June 1, C. D.—May 7, E. N.-R.

†**O., New Lexington**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to J. Grant & Sons, 3866 Carnegie Ave., Cleveland, $49,971. Bids May 14. Noted May 19, C. D.—Apr. 23, E. N.-R.

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†*Federal Government*

Public Buildings (Continued)

†Pa., Cannonsbury—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Structural Eng. Corp., 110 East 42nd St., New York, $58,114. Bids Apr. 28. Noted May 1, C. D.—Apr. 9, E. N.-R.

Pa., Wilkes-Barre—Luzerne Co., W. W. Multer, controller. 2 and 3 story, 46x196 ft. brick, steel, stone addition to Luzerne Co. Jail, to be used as building for women, incl. clinics, dormitories, etc., North River St., to Alaimo & Sons, Pittston. Est. exceeds $140,000.

†S. C., Sumter—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to T. E. Moore, 1118 Taylor St., Columbia, $71,900. Bids June 9. Noted June 16, C. D.—May 14, E. N.-R.

†Tex., Dallas—A. J. Rife, Constr. Co., general contractors, 1913 North Harwood St., Dallas, plumbing, heating and refrigeration for U. S. Post Office for Treas. Dpt. at office Sup. Archt., Wash., D. C., to W. F. Kaun & Son, 2822 Arrayo St.***structural steel, to Austin Bros., 1815 Coombs St.***steel caissons, to Mosher Steel & Mchy. Co., 5101 Maple Ave. ***excavating, sand and graveling, to Vilbig Bros., Paris and Bourbon Sts.***steel windows, to Truscon Steel Co., Construction Bldg.*** cement, to Lone Star Cement Co., Santa Fe Bldg.***glass and glazing, to Pittsburgh Plate Glass Co., Sante Fe Bldg.***lathing and paster, to L. G. Buis, 3921 Windsor St.***marble, to Vermont Marble Co. of Texas, 1513 Wall St.*** hollow clay tile, to Reliance Clay Products Co., 1705 Orange St.***common brick, to Ferris Brick Co., 314 South Preston St.***Texas Cordova Cream limestone, to Texas Quarries, Inc. Austin*** 4 vault doors, to Herring-Hall-Marvin Safe Co., Hamilton, O.***hollow metal work, to Niedringhaus, Inc., 6739 Natural Bridge Ave., St. Louis, Mo.***finish hardware, to Lockwood Hardware Co., Fitchburg, Mass. ***electrical wiring and clock system, to Broome Electric Co., Amarillo***ornamental metal work, to Boland Machine & Mfg. Co., 1006 Tchoupiloulas St., New Orleans, La.***reinforcing steel, to Sheffield Steel Corp., Sheffield Station, Kansas City, Mo. Noted Mar. 10, C. D.—Mar. 12, E. N.-R., under "Contracts Awarded."

†Va., Rocky Mount—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to L. B. Gallimore, 910 Silver Ave., Greensboro, N. C., $43,330. Bids Apr. 24. Noted Apr. 28, C. D.—Apr. 2, E. N.-R.

†Wash., Bremerton—Yards & Docks, Navy Dpt., Wash., D. C., freight elevator for Building 104, to Montgomery Elevator Co., Moline, Ill., $4,344. Bids June 1. Noted June 17, C. D.—May 21, E. N.-R.

†Wis., Park Falls—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Midwest Constr. Co., 748 Builders Exchange Bldg., Minneapolis, Minn., $93,452. Bids May 28. Noted June 2, C. D.—May 7, E. N.-R.

†Wis., Prairie du Chein—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to J. P. Cullen & Son, Janesville, $54,701. Bids Apr. 30. Noted May 5, C. D.—Apr. 16, E. N.-R.

Que., Valcartier—Secretary, Dpt. National Defence, Ottawa, Ont., constructing new quarters for married men, to A. Deshauriers Ltee, 68 Lalimente St., Quebec. Est. $150,000. Noted May 19, C. D.—May 21, E. N.-R.

COMMERCIAL BUILDINGS

PROPOSED WORK

Conn., Hartford — St. Anthony's Roman Catholic Church, A. J. Kelly, pastor, F. A. Pallotti, chn. church comn., yellow brick, stone church, Market St., $140,000. Project in abeyance. D. A. Guerriero, 62 Milford St., archt. Noted Apr. 16, C. D.—Apr. 30 E. N.-R

Idaho, Idaho Falls—B. M. Rogers plans 3 story, basement, 128x140 ft. hotel. J. L. Shane, Chicago, Ill., archt.

Mich., Ann Arbor—Stanley Waltz, mgr., Michigan Union, soon lets contract foundation, basement walls and footings for 100x150 ft., steel club on State St. To exceed $140,000. Lane, Davenport & Meyer, 710 Donovan Bldg., Detroit, archts.

Miss., Tupelo—North Mississippi Community Hospital Corp., c/o B. W. Reed, pres., at office of Secretary, 117 Broadway, North Tupelo, soon lets contract 2 story, basement, brick, stone hospital; 2 story, basement, brick nurses' home building in suburban Tupelo on Hy. 45. H. C. Pelton and J. G. Rogers, 415 Lexington Ave., New York, archts. Noted June 9, C. D.—May 21, E. N.-R.

Mo., St. Louis—Company to be formed, c/o F. Wehrenberg, pres. South Side Amusement Co., 2735 Cherokee St., plans by A. F. and A. Stauder, 6921 A Gravois Ave., 2 story, basement, brick, stone theatre and store, 3196 Morganford Rd. Noted Oct. 4, C. D.—Oct. 10, E. N.-R.

†Federal Government

★ **Nev., Las Vegas**—Boulder Dam Hotel Corp., c/o H. J. Wiesler, Bank of America Bldg., San Diego, Calif., plans by Wilson, Merrill & Alexander, 549 Petroleum Securities Bldg., Los Angeles, Calif., for hotel project three mi. of Las Vegas, Spanish style, incl. casino, dining room, outdoor patio, spa with swimming pool, five individual guest houses, air conditioning, constructing track and golf course. $2,500,000.

N. J., Waldwick—Ridgewald Highlands Home Co., plans group dwelling and tract development. To exceed $300,000.

N. Y., Brooklyn—Agatha Ruck, 32 South Oxford St., plans by Cohn Bros., 191 Joralemon St., 6 story apartment, 32-36 South Oxford St. Est. about $140,000.

N. Y., Brooklyn—Abe Hartman, 16 Court St., plans by Kavy & Kavovitt, 16 Court St., 6 story apartment, 1473 55th St. and 15th Ave. $140,000.

N. Y., Brooklyn—Corporation, c/o E. Flagg, archt., 111 East 40th St., New York, sketches constructing 9 story apartment, 73rd St. between Ridge Blvd. and Colonial Rd. To exceed $400,000.

N. Y., Brooklyn—East River Savings Bank, 26 Courtland St., New York, plans by O. I. Silverman, c/o owner, altering plumbing and heating in 3 story apartment, 1304 Pacific St. $38,000 with fixtures.

N. Y., Brooklyn—Lincoln Savings Bank, 531 Bway., plans by A. Goldberg, 164 Montague St., altering heating, plumbing in two 4 story apartments, 225 Hart St. $40,000.

N. Y., Douglaston—Desirable Homes, Inc., Cambria Ave. and Marathon Parkway, Little Neck, plans by A. Fahr, 90-23 161st St., Jamaica, group frame buildings, Cambria Ave. $140,000.

N. Y., East Greenbush—J. J. Nyhoff, East Greenbush, plans constructing group residences. To exceed $140,000. Reuber & Demers, 24 James St., Albany, archts.

N. Y., East Hampton — Richard Allen, 500 5th Ave., New York, plans by R. B. Webb, c/o owner, constructing hotel, casino and bathing pavilion, Marine Blvd. and 12th St. To exceed $140,000.

N. Y., Flushing—B. Lorber, 35-14 72nd St., Jackson Heights, plans by S. M. Palm, 159-15 Northern Blvd., group 1 and 2 story, frame dwellings, 149th St. near 32nd Ave. $140,000.

N. Y., Jamaica — Briarwood Estates, Inc., 69-50 Ingram St., Forest Hills, plans group 2 story, frame dwellings Coolidge Ave. near 141st St. $140,000. Private plans.

N. Y., Jamaica — Benreiz Investment Co., 122nd St. and 135th Ave., plans by Seelig & Finkelstein, 531 Pierrepont St., Brooklyn, constructing group frame dwellings, 122nd St. and 149th Ave. $140,000.

N. Y., Jamaica—Order of St. Dominic, c/o Gray & Tomlin, 32 Court St., Brooklyn, plans school, Shelton Ave. and 161st St. $140,000 or more.

N. Y., Lackawanna—Bethlehem Steel Corp., Bethlehem, Pa., plans group steel dwellings for workers' village. $200,000. Private plans.

N. Y., Long Island City—Ames Realty Corp., 24-36 43rd St., Long Island City, group 4 story, tenements, 34th Ave. and 34th St. $140,000. C. W. Marsac, 31-16 30th Ave., archt.

N. Y., Long Island City—Madden Apartments, Inc., 16 Court St., plans by Kavy & Kavovitt, 16 Court St., Brooklyn, constructing two 4 story apartments, 41st and Greenpoint Aves. Est. about $140,000.

N. Y., Long Island City—Q. and R. Realty Corp., 155 East 44th St., plans by M. W. De Gaudio, 545 5th Ave., New York, 6 story, apartment, 47th Ave. and 42nd St. $150,000.

N. Y., Lyons—First Presbyterian Church, 105 Broad St., bids in summer 1936, constructing church, Broad St. $140,000. R. S. Westbrook, Lyons, archt. Noted Feb. 14, C. D.—Feb. 20, E. N.-R.

N. Y., New York—Beekman Studios, Inc., 570 7th Ave., plans by W. F. Marshall, 3rd, 249 East 43rd St., altering, heating, plumbing in 11 story apartment, 230 East 50th St. Est. about $40,000 with fixtures.

N. Y., New York—Bradbag Realty Corp., 2750 Boston Rd., plans by J. M. Felson, 250 West 57th St. (2nd unit), 6 story, 108x154 ft. apartment, Morris Ave. $250,000.

N. Y., New York—Carlhym Realty Corp., c/o C. Racklin, 1539 Undercliff Ave., plans by C. Kreymborg, 349 East 149th St., 6 story apartment, Clarke Pl. and Walton Ave. $140,000.

N. Y., New York—Ceri Realty Co., 11 Cooper St., plans by G. A. Bagge, c/o owner, 6 story apartment, 692 Academy St. $140,000.

N. Y., New York—Cities Service Co., 60 Wall St., plans altering 7th floor offices into gymnasium, 70 Pine St. Est. about $140,000. Architect not appointed. A. A. McGovern, 41 East 42nd St., lessee.

N. Y., New York—Clifford Davidson Corp., 21 East 40th St., plans by H. H. Lilien, 1476 Walton Ave., 6 story apartment, Sedgewick Ave., near 197th St. $350,000.

N. Y., New York—C. Dockter, 2707 Creston Ave., plans by A. B. Bates, 2526 Webster Ave., group 2 story, brick, dwellings, Tenbroeck Ave. near Neill Ave. $140,000.

N. Y., New York—Dorimar Ltd., 141 Bway., will not alter heating, plumbing in 4 story apartment, 36 East 65th St. Project indefinitely postponed. $40,000. G. P. Butler, Jr., 40 East 49th St., archt. Noted May 4, C. D.

N. Y., New York—F. F. B. Realty Corp., 572 Madison Ave., plans by H. I. Feldman, 15 West 44th St., 6 story apartment, 18 Nagle Ave. $350,000.

N. Y., New York—E. R. Fischer, c/o Wilzin & Halperin, 1270 6th Ave., plans by W. C. Sommerfield, 31 Union Sq., altering plumbing, heating in 5 story, store and apartment, 981 8th Ave. $45,000.

N. Y., New York—G and M Realty Corp., J. Geltman, 29 West Tremont Ave., plans by I. L. Crausman, 332 East 149th St., 3 story, apartment, 233rd St. and Albany Crescent. $200,000.

N. Y., New York—Gerard 153rd Street Corp., A. Stillman, pres., 1095 Walton Ave., plans by R. E. Golden, 135 West 79th St., 6 story apartment, Walton Ave. and 153rd St. $300,000.

N. Y., New York—Halbridge Realty Corp., 2175 Walton Ave., plans by J. M. Felson, 250 West 57th St., 6 story apartment, Bainbridge Ave. near 177th St. Est. about $140,000.

N. Y., New York—Hargold Realty Corp., 1592 Jessup Ave., plans by H. I. Feldman, 15 West 44th St., 6 story apartment, Jessup Ave. near Featherbed Lane. $140,000.

N. Y., New York—Hassad Realty Corp., M. Bogdanoff, pres., 760 Grand Concourse, 6 story apartment, Decatur Ave. near Mosholu Parkway. $200,000. Site acquired. Architect not appointed.

N. Y., New York—Kajul Realty Corp., 816 Avenue N, c/o K. Glass, plans by H. I. Feldman, 15 West 44th St., 6 story, apartment, Billingsley Terrace and Phelan Pl. $240,000.

N. Y., New York—Lacoma Trading Co., c/o J. C. Botte, 11 Park Pl., plans theatre, 504 Columbus Ave. Est. about $140,000. Architect not appointed. **Maturity indefinite.**

N. Y., New York — Loew's Theaters, Inc., 1540 Bway., New York, plans altering heating, plumbing, air conditioning in theatre, 65th St. and Bway. To exceed $40,000. Architect not appointed.

N. Y., New York—Hasad Realty Corp., 165 East 156th St., plans by C. Kreymborg, 349 East 149th St., constructing apartment, Decatur Ave. and Mosholu Parkway. $140,000.

N. Y., New York—Lipman Associates, 30 Mazaw Pl., plans by Miller & Goldhammer, 40 East 49th St., 6 story, basement apartment, 172nd St. and Bway. $140,000.

N. Y., New York—Madison Equities, Inc., 1115 West 117th St., plans by J. M. Felson, 250 West 57th St. 6 story apartment, 178th St. near Grand Concourse. $175,000.

N. Y., New York—Markham Estates, 35 East Van Cortlandt Ave., plans by C. Kreymborg, 349 East 149th St., 6 story apartment, 182nd St. and Valentine Ave. $140,000.

N. Y., New York—Maxam Estates, 342 Madison Ave., plans by H. H. Lilien, 1476 Walton Ave., 6 story, 93x180 ft. apartment, 4680 Bway. $300,000.

N. Y., New York—Mutual Life Insurance Co. of New York, 32 Nassau St., plans by A. D. Anstey, c/o owner, altering heating, plumbing in stores, 585-589 Lexington Ave. $37,000 with fixtures.

N. Y., New York—North American Holding Co., 1360 Garrison Ave., plans by J. M. Felson, 250 West 57th St., constructing 6 story apartment, Grand Concourse and 167th St. $350,000.

N. Y., New York—North Street Realty Corp., 20 Featherbed Lane, plans by H. I. Feldman, 15 West 44th St., 6 story apartment, North St. near Fordham Rd. $140,000.

N. Y., New York—Ogden Goelet, 606 5th Ave., plans altering heating, plumbing, mechanical equipment in store and office building, 606 5th Ave. $38,000 with fixtures. Private plans.

N. Y., New York—Parkside Estates, Inc., 215 East 149th St., plans by P. Lubroth, 283 Kingsbridge Rd., 6 story apartment, Boston Rd. and Bronx Park East. $200,000.

N. Y., New York—Parkside Estate, Inc., 215 East 149th St., plans by J. Lubroth, c/o owner, apartment, Lydig Ave. and Bronx Park East. $150,000.

N. Y., New York—Premier Equities, Inc., J. Alkoff, pres., 40 West Burnside Ave., plans by I. L. Crausman, 332 East 149th St., constructing 6 story apartment, Marion Ave. and 194th St. $140,000.

N. Y., New York—Sedac Realty Corp., 207 East 202nd St., plans by Bates & Hindsmann, 2526 Webster Ave., constructing 6 story apartment, 203rd St. and Mosholu Parkway. $140,000.

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Commercial Buildings (Continued)

N. Y., New York—Herman Spector, 350 East 149th St., plans by I. L. Crausman, 332 East 149th St., 6 story apartment, 197th St. near Bainbridge Ave. $140,000.

N. Y., New York—C. Racklin, 1539 Undercliff Ave., plans by C. Kreymborg, 349 East 149th St., 6 story apartment, Undercliff Ave. near 176th St. $370,000.

N. Y., New York—Morris Resnik, 349 East 149th St., plans by C. Kreymborg, 349 East 149th St., constructing apartment, Greystone Ave. near 238th St. $140,000.

N. Y., New York—Three Hundred Twenty West 90th Street Corp., 111 West 94th St., plans by S. Bien, 415 Lexington Ave., 6 story apartment, 320 West 90th St. $140,000.

N. Y., New York—Tiebout Equities, 1115 East 177th St., plans by J. M. Felson, 250 West 57th St., 6 story, basement, brick, steel apartment, Tiebout Ave. near 184th St. $200,000.

N. Y., New York—S. Weiner, 1000 Fox St., plans by W. I. Hauser, 1841 Bway., 6 story apartment, Clinton Ave. and 176th St. $140,000.

N. Y., New York—W. Weintraub, 2579 Marion Ave., plans by H. I. Feifman, 15 West 44th St., 6 story apartment, University Ave. near 197th St. Est. about $140,000.

N. Y., New York—Rexton Realty Co., 551 5th Ave., plans by G. F. Pelham, Jr., 570 7th Ave., constructing 8 story factory, 446 West 41st St. $110,000.

N. Y., Perry—Schine Chain Theatre, 40 Main St., Gloversville, rejected bids April 15, constructing theatre, P. M. Hulsken & L. T. Strong, 505 Savings Bldg., Lima, O., archts. Will readvertise on revised plans. Noted Apr. 21, C. D.—Apr. 9, E. N.-R.

N. Y., Richmond Hill—Krugonad Realty Corp., 83-55 Parsons Blvd., Jamaica, plans by W. P. LaVallee, 132-17 106th St., Ozone Park, group 2 story frame dwellings, Van Wyck Blvd. and 130th Ave. $140,000.

N. Y., Woodbridge—Cooperative Fire Insurance Co., c/o A. H. Okun, archt., 16 Starr Ave., Monticello, plans nearing completion constructing rein.-con. office building. Now taking bids on certain materials.

N. Y., Woodside—Wynwode Homes, 63rd St., plans by A. E. Allen, Garden City, constructing group 2 story, brick dwellings, 63rd St. and Laurel Hill Blvd. $140,000.

Ore., Portland—Mrs. N. Schafer, plans by A. A. Williams, Gerlinger Bldg., 6 story, basement, 12x142 ft. concrete, rein.-con. apartment, plain found., 22nd St. and Davis Ave. $270,000. Noted Feb. 11, C. D.—Feb. 20, E. N.-R.

Ont., Hamilton—Leo M. Barnett, 10 Market Sq., plans by W. J. Walsh, Jr., 128 King St. E., constructing modern theater, 1,200 seating capacity, James St. N. $150,000.

Ont., Toronto — A. W. Robertson Ltd., 275 Fleet St. W., plans by Chapman & Oxley, 372 Bay St., completing 23 story, rein.-con. office building (work suspended 1930). $150,000.

Que., Bellerieve—Roman Catholic Parish of Bellerieve de Valleyfield, plans by J. M. Lafleur, Valleyfield, and soon takes bids rein.-con., stone church, plain found., Front St. $200,000.

Que., Lennoxville—Governors of Bishop College, G. H. Montgomery, chn., 360 St. James W., Montreal, plans by Barot & Blackader, 610 St. Catherine St. W., Montreal, college. $150,000. Noted May 29, C. D.—June 4, E. N.-R.

BIDS ASKED

Ill., Elmwood Park—Mont Claire Theatre Corp., 7133 West Grand Ave., Chicago, bids about June 30, 125 x 150 ft. brick, theatre and store building, 76th and West Grand Aves., $150,000.

La., New Orleans—July 14, by R. L. Thompson, agt., constructing addition to Federal Land Bank, Contrs. (1) general contract (2) elevators (3) air conditioning and steam heating system (4) plumbing (5) electrical work at St. Charles St., for Federal Land Bank.

N. J., Clifford Beach (Keyport P. O.) — See "Contracts Awarded."

N. Y., Binghamton—See "Contracts Awarded."

N. Y., Brooklyn—See "Contracts Awarded."

N. Y., Endicott—See "Contracts Awarded."

N. Y., Flushing—See "Contracts Awarded."

N. Y., Glendale—See "Contracts Awarded."

N. Y., Jamaica—See "Contracts Awarded."

N. Y., New York—See "Contracts Awarded."

N. Y., Rego Park—See "Contracts Awarded."

N. Y., New York—Fifth Avenue and 12th Street Corp., 55 5th Ave., bids about July 1, altering heating, plumbing in 5 story apartment, 433 West 57th St. $140,000. Munogue & Palmer, 17 East 49th St., archts. Noted May 11, C. D.—May 14, E. N.-R.

N. Y., New York—Inch Corp., 15 Broad St., New York, taking bids general and separate contracts altering heating, plumbing in 12 story apartment, 401 Park Ave. $37,000 with fixtures. J. M. Berlinger, 17 East 49th St., archt. Noted May 11, C. D.—May 14, E. N.-R.

N. Y., Queens Village — See "Contracts Awarded."

N. Y., Westbury—See "Contracts Awarded."

N. Y., Winfield—See "Contracts Awarded."

N. Y., Woodhaven—See "Contracts Awarded."

CONTRACTS AWARDED

Calif., San Francisco—J. L. McLaughlin, general contractor, 251 Kearny St., electrical work for school, Broadway and Franklin St., to E. J. Lynch, 2080 Sutter St., for Roman Catholic Archbishop, 1100 Franklin St.***steel forms, to Concrete Eng. Co., 1280 Indiana St.***reinforcing steel to W. S. Wetenhall, 17th and Wisconsin Sts.***plastering, to H. Bosch, 2075 Folsom St. ***sheet metal, to Guilfoy Cornice Wks., 1234 Howard St. Noted May 26, C. D.—June 4, E. N.-R. under "Contracts Awarded."

★ **Del., Wilmington**—E. I. du Pont de Nemours & Co., Wilmington, concrete pile foundation work for 15 story, basement, 100x290 ft., brick, rein.-con., steel office, Orange St., to Turner Constr. Co., Architects Bldg., Phila., Pa., awarded Mar. 10***cement and concrete for superstructure, to Winslow Constr. Co., 1700 Walnut St., Phila., Pa., awarded Apr. 24, Winslow Constr. Co., Phila., Pa., awarded contract 200 tons reinforcing steel, to Taylor Steel & Wire Co., D St. above Erie Ave., Phila., Pa. Total est. $1,500,000.

La., Baton Rouge—Daltons Dpt. Store, installing new air conditioning system in store 70 tons equipment, to Carrier Eng. Corp., Hibernia Bldg., New Orleans, $22,000.

Ill., Chicago — Goldblatt Bros., 3932 South Lincoln St., masonry and carpentry for 2 story, 215x217 ft. top addition, 26th and Turner Sts., to Morris Handler Co., 2718 West Chicago St.; reinforcing steel, to J. T. Ryerson, 2551 West 16th St. Est. $250,000. Noted June 2, C. D. —June 4, E. N.-R.

Ind., Notre Dame—Notre Dame University, Notre Dame, general contract 3 story, basement, brick, steel biology building, College Campus, to T. L. Hickey, Inc., 121 North Hill St., South Bend, $300,000. Awarded May 29.

Mich., Detroit—Allied Jewish Assn., c/o I. M. Lewis, archt., concrete work for Jewish Home, Petoskey Ave., to E. W. Thomson Co., 6209 16th St., masonry work, to Connors & Fidler Constr. Co., 217 Woodward Ave., Detroit. Est. $150,000.

Mo., University City—H. P. Hess, archt., 1001 Ambassador Bldg., St. Louis, June 12, general contract 1 story, basement, 70 x 130 ft., concrete Bedford stone church with auditorium, Westgate and Clemens Aves., for All Saints Roman Catholic Church, c/o G. M. Ryan, pastor, from Kloster Co., 5215 South Grand Blvd., St. Louis***plumbing, from McNamara Equipment Co., 6236 Delmar St.***electrical work, from Paul Wendt Electric Co., 4141 West Florissant Ave.***heating, from T. J. Sullivan Heating Co., 7211 Dale Ave. Noted June 8, C. D.

Neb., Omaha — Herald Building Co., 1502 Farnam St., general contract store and convention hall, 15th and Farnam Sts., to W. Boyd Jones, 959 Omaha Natl. Bank Bldg., about $150,000.

N. J., Clifford Beach (Keyport P. O.)—Morrisey & Walker, Clifford Beach, Raritan Bay, constructing group summer cabins (first unit will be 30 dwellings) on Raritan Bay, day labor and separate contracts. $140,000.

N. Y., Baldwinsville—F. W. Van Wie, 10 East Genesee St., general contract business block, Oswego St., to Byrne Constr. Co., Inc., 411 Roberts Ave., Syracuse. Noted Apr. 7, C. D.—Apr. 9, E. N.-R.

N. Y., Binghamton—Vestal Hills Corp., J. R. Thorne, pres., constructing group residences, on MacArthur Tract, Vestal Ave., own forces. Owner will purchase materials. Private plans. Noted June 5, C. D.—June 11, E. N.-R.

N. Y., Brooklyn—S. Geller, 1555 East 29th St., 6 story apartment, 2016 Avenue N, separate contracts now being awarded. $185,000. Kavy & Kavovitt, 16 Court St., archts. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Brooklyn—Manbern Realty Corp., 2885 Coney Island Ave., constructing 6 story apartment, Oriental Blvd. and Dover St., separate contracts now being awarded. Est. about $140,000. Seelig & Finkelstein, 153 Pierrepont St., archts.

N. Y., Brooklyn—Seventy-five Martense Street Corp., 2715 Avenue K, 6 story, apartment, 75 Martense St., separate contracts now being awarded. $150,000. M. N. Weinstein, 93 Court St., archt. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Brooklyn—Harry Waxman, 2031 [illegible] 2nd St., Brooklyn, constructing group frame [illegible] ings, Ocean Ave. near Hampton Ave., [illegible] Dover St., day labor and separate cont[illegible] $140,000. I. Kallich, 375 Fulton St., [illegible] Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Brooklyn—Williamsburg Savings [illegible] 1 Hanson Pl., altering heating, plumbing [illegible] story, apartment, 109 Greenpoint Ave., sep[illegible] contracts awarded. $37,000 with fixtures. [illegible] Prowler, 367 Fulton St., archt. Noted May [illegible] C. D.—May 28, E. N.-R.

N. Y., Brooklyn—Corporation, c/o N. K[illegible] loff, 449 Kings Highway, group 2 story [illegible] dwellings, East 28th St. and Quentin Rd [illegible] labor and separate contracts. $140,000 [illegible] Kallich, 375 Fulton St., archt. Noted May [illegible] C. D.—May 28, E. N.-R.

N. Y., Brooklyn—Twin Oaks Realty [illegible] 1603 Flatbush Ave., constructing group [illegible] dwellings East 49th St. and Beverly Rd [illegible] day labor and separate contracts. $140,000 [illegible] Owner purchasing materials. Lama & [illegible] kauer, 383 Jay St., archt. Noted May 18, C. D. —May 21, E. N.-R.

N. Y., Buffalo—Buffalo Savings Bank, Main and Genesee Sts., air conditioning for bank, to Mollenberg Beltz Machine Co., 20 Henry St. Bids May 18. Noted May 15, C. D.

N. Y., Buffalo—W. T. Spann, archt., 30 Henley Rd., Buffalo, general contract store for Greene Estate and H. Winship, Brisbane Bldg., to Paris Constr. Co., Brisbane Bldg. Est. $105,000. Noted May 20, C. D.—June 4, E. N.-R.

N. Y., Elmhurst — Wellington Apartments Inc., 26 Court St., M. Goetz, pres., 6 story apartment, Whitney Ave. near Case St., separate contracts now being awarded. $375,000. M. N. Weinstein, 93 Court St., archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., Endicott—International Business Machines Corp., Endicott, constructing country club, own forces. To exceed $137,000. J. M. Demarest, c/o owners, in charge.

N. Y., Flushing—Jaxland Realty Co., 142nd St., group 2 story dwellings, North Hempstead Turnpike and 142nd St., separate contracts $140,000. J. Unger, 39-01 Main St., Flushing, archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., Flushing—Gutterman Developers, 189th St. and Northern Blvd., group 2 story, frame dwellings, 169th St. and 33rd Rd., separate contracts and day labor. $140,000. Owner is purchasing materials. S. M. Palm, 159-15 Northern Blvd., archt.

N. Y., Flushing—J. Stankewitch, 40-45 74th St., Jackson Heights, group 2 story, frame dwellings, 59th Ave. and Main St., separate contracts. $140,000. Private plans. Noted May 18, C. D.—May 21, E. N.-R.

N. Y., Glendale—Sylvania Homes, Inc., Paramount Bldg., New York, constructing group 1 story, brick dwellings, Calamus Ave. and 74th St., by day labor and separate contracts. $140,000. Owner is purchasing materials. S. M. Palm, 159-15 Northern Blvd., Flushing, archt. Noted May 22, C. D.—May 28, E. N.-R.

N. Y., Jamaica — Briarwood Estates, Inc., 69-50 Ingram St., Forest Hills, group 2 story, frame dwellings, separate contracts now being awarded. $140,000. A. A. Marley, c/o owner, archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., Jamaica—Display Homes, Inc., 391 Fulton St., Brooklyn, group 28 x 29 ft. frame dwellings, 80th Rd. near Surrey Pl., day labor and separate contracts. $140,000. Owner will purchase materials. M. Rothstein c/o owner, archt. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., New York—C. T. Wills, general contractor, 285 5th Ave., 2 elevators in office building addition, 40 West 40th St., for American Radiator Co., 40 West 40th St., to Otis Elevator Co., 11th Ave. and 26th St., about $40,000. Noted May 4, C. D.—May 7, E. N.-R., under "Contracts Awarded."

N. Y., New York—E. Bornholft, 33-31 89th St., constructing, altering heating, plumbing in 5 story apartments and store, 1258 3rd Ave., separate contracts. $37,000. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., New York—Carbari Realty Corp., 90 Broad St., altering, heating, plumbing in 5 story apartment, 11th St. and 5th Ave., separate contracts now being awarded. $40,000. W. H. Wright, c/o owner, archt. Noted May 14, C. D. —May 21 E. N.-R.

★ **N. Y., New York**—Corporation, c/o J. Perlbinder, 535 5th Ave., 6 story apartment, McClellan St. and Sheridan Ave., separate contracts. $700,000. H. I. Feldman, 15 West 44th St., archt. Noted May 18, C. D.—May 21, E. N.-R.

N. Y., New York—Dale Housing Corp., W. D. Coen, in charge, 119 West 25th St., constructing group frame dwellings, Tenbroeck Ave. near Neill Ave., day labor. $140,000. Owner is purchasing materials. S. M. Palm, 159-15 Northern Blvd., Flushing, archt. Noted May 21, C. D.—May 28, E. N.-R.

†*Federal Government*

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Commercial Buildings (Continued)

N. Y., New York—G. and G. Realty Co., 3674 Bronx Blvd., group 2½ story dwellings, Liebig Ave. near 259th St., separate contracts. $140,000. F. J. Ross, c/o owner, archt. Noted May 18, C. D.—May 21, E. N.-R.

N. Y., New York—Greenwood Cemetery, 52 Vanderbilt Ave., altering heating, plumbing in 6 story apartment, 18 Jefferson St., to Shroder & Koppel, 295 Madison Ave. Est. $60,000. Noted May 13, C. D.—May 21, E. N.-R.

N. Y., New York—Joban Realty Corp., 975 Walton Ave., constructing 6 story apartment, 153rd St. and Gerard Ave., separate contracts now being awarded. $140,000. Miller & Goldhammer, 40 East 49th St., archts. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., New York—Marmion Realty Corp., 1165 East 175th St., 6 story apartment, Marmion Ave. and 175th St., separate contracts now being awarded. $150,000. H. Ginsbern, 205 East 42nd St., archt. Noted May 13, C. D. May 21, E. N.-R.

N. Y., New York—Norchald Realty Corp., 1070 Anderson Ave., 6 story apartment, Anderson Ave. and 166th St., separate contracts now being awarded. $250,000. H. Ginsberg, 205 East 42nd St., archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., New York—Rosa Realty Corp., 165 East 156th St., 6 story apartment, 83 Park Terrace, separate contracts now being awarded. $140,000. C. Kreymborg, 349 East 149th St., archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., New York—Timken Realty Corp., 597 Madison Ave., altering heating, plumbing in 17 story, office, separate contracts, $37,000 with fixtures. V. Bark, Jr., 1351 Bway., archt. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Olean — Emanuel Lutheran Church, Laurens St., general contract church, to F. T. Couglin, 115½ West State St.***plumbing, to Hickey Bros., 256 North Union St.***heating, to W. H. Simpson, 184 North Union St.***electrical work, to Gabler Electric Co., 116 South 4th St. Bids June 5. Noted June 11, C. D.

N. Y., Rego Park—Nira Homes, Inc., 96-19 91st Ave., Woodhaven, constructing group 2 story, frame dwellings, Alderton St., day labor and separate contracts. To exceed $200,000. Owner is purchasing materials. A. E. Allen, Garden City, archt. Noted May 13, C. D.—May 21, E. N.-R.

N. Y., Rochester — Lewiston Avenue Methodist Church, Dewey and Christian Aves., general contract church on 140x185 ft. site, Dewey Ave., to Raymond Hyland, 878 Ridgeway Ave. Noted Feb. 19, C. D.—Feb. 27, E. N.-R.

N. Y., Rochester—A. Goldstein, general contractor, 215 Cumberland St., structural steel and reinforcing steel for infirmary, for Jewish Home for Aged, 1162 St. Paul St., Rochester, to Genesee Bridge Co., 344 West Ave., Rochester; cast stone, to Goodstone Mfg. Co., 470 Hollenbeck St., Rochester. Noted June 5, C. D. —June 11, E. N.-R.

N. Y., Queens Village—Interpark Homes, Inc., 93-31 85th Rd., group 2 story frame dwellings, 219th St. and 91st Ave., separate contracts and day labor. $140,000. Owner is purchasing materials. J. E. Cahill, 89-65 163rd St., Jamaica, archt. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Westbury—Droesch & Sons, Inc., Metropolitan Ave., Maspeth, constructing 350 residences at Ellison Ave. and Westbury Rd., near Grand Central Northern State Parkway, day labor. F. J. Burmeister, 155-31 Jamaica Ave., Jamaica, archt.

N. Y., Williamsville—St. Mary of the Angels, Mill St., general contract 4 story, basement administration building, Mill St., to Kempf Sons, Inc., 389 Humboldt Parkway, Buffalo. Est. exceeds $140,000.

N. Y., Winfield—Hyatt Realty Co., 5300 65th Pl., constructing group 2 story, brick dwellings, 64th St. and 53rd Ave., separate contracts and day labor. $140,000. B. Driesler, 163 Remsen St., Brooklyn, archt. Noted May 14, C. D.—May 21, E. N.-R.

N. Y., Woodhaven—True Homes, Inc., 163-18 Jamaica Ave., Jamaica, group 1 story, brick dwellings, 133rd Ave. and 86th St., separate contracts and day labor. Owner is purchasing materials. D. J. Levinson, 161-02 84th Dr., Jamaica, archt. Noted May 18, C. D.—May 21, E. N.-R.

Va., Richmond—Meyer Greentree, modernizing, remodeling store building, Seventh and Broads Sts., to Doyle & Russell, Central Natl. Bank Bldg. Est. $150,000-$170,000.

Wis., Neenah—Kimberly-Clark Corp., general contract, 3 story, 85x100 ft. office building, to C. R. Meyer & Sons, Oshkosh. Private plans.

Ont., Toronto—W. B. Isbister, 5 Burlington St., masonry for 32 suite apartment house, Bathurst St. near Heathdale Rd., to Fidani Bros., 272 Laughton Ave.***plumbing, to John Sheard, 1809 Dufferin St.***structural steel, to John T. Hepburn Ltd., 18 Van Horne St. Noted May 25, C. D.—May 28, E. N.-R.

Ont., Toronto — Carr & Barnes, Ltd., 2498 Younge St., constructing 32 suites, brick, steel apartment house, Eglinton Ave. and Russell Hill Rd., $150,000. Owner builds.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Calif., Bakersfield — PLANT — Shell Oil Co., 1008 West 6th St., Los Angeles, making plans distributing plant comprised of offices, garage, warehouses, tool racks, electricians building, etc. Private plans.

Calif., Oakland — WAREHOUSE — General Petroleum Corp., 519 19th St., soon lets contract 1 story, 80x170 ft., steel warehouse, Pier St. Private plans. Noted Apr. 7, C. D.—Apr. 9, E. N.-R.

★ **Calif., San Francisco**—BUS TERMINAL—Atchison, Topeka & Santa Fe R. R., 114 Sansome St., plans 2 story, basement, Class "A" railway bus terminal, 4th and Jessie Sts. $500,000 or more. Site purchased.

Calif., West Los Angeles—POWER HOUSE—Twentieth Century-Fox Film Corp., 10260 Orton Ave., plans completed 1 story, 82x112 ft., rein.-con. Class A power house. Est. $50,000. J. A. Barlow, 10260 Orton Ave., engr.

Conn., New Haven—PLANT—Hull Brewing Co., 820 Congress Ave., soon lets contract (selected list contractors), 2 story, basement, 61x100 ft. brick, steel beer bottling and canning plant, Bond St. $55,000. H. H. Davis, 20 Whitney Ave., archt. A. M. Thomas, 20 Whitney Ave., engr.

★ **Fla., Fernandina**—KRAFT and PULP MILL Container Corp. of America, 111 West Washington St., Chicago, Ill., plans kraft and pulp and paper mills; grading, filling, bulkheading will be done by the municipality, est. about $100,000. Total est. $5,500,000. G. F. Hardy, 305 Bway., New York, engr.

Idaho, Wallace—MILLING PLANT—Polaris Mining & Dev. Co., plans milling plant at mouth Rosebud Gulch, a similar mill proposed for Hecla Mining Co. J. F. McCarthy, genl. mgr. for both properties.

Ind., Fort Wayne—FACTORY—Wayne Pump Co., C. G. Guild, secy., plans heating plant for factory, incl. two 300 hp. boilers, brick or concrete-stack, automatic stokers, rein.-con. coal bunkers.

Ind., Vincennes—PLANING MILL—Neihaus Lumber Co., plans 2 story, 40x85 ft. planing mill, 11th and Main Sts. Private plans. Site purchased.

Kan., Ft. Scott—PLANT—American Service Co., Fairfax Bldg., Kansas City, Mo., plans complete new plant and remodeling of part of old building of present 6th St. plant, with a modern plant. Will have either diesel engine or gas engine for power. F. O'Connor, genl. mgr.

Md., Baltimore — Terminal Distributing Co., 421 East Monument St., Baltimore, soon lets contract 2 story, 135x168 ft. warehouse, Guilford Ave. and Bath St. $75,000. C. T. McClure, 3011 Wylie Ave., archt.

Mich., Detroit—BREWERY—Kraft Brewing Co., 1800 Forest Ave., plans by G. B. Bright, archt. and engr., 2615 Twelfth St., 2 and 3 story, basement, brick, steel, rein.-con. brewery plant, incl. fermenting cellars, storage cellars, wash house and rack room, plain found., Orleans St. $150,000.

Mich., Detroit—FORGING PLANT—Detroit Forging Co., 3564 Toledo Ave., plans 1 and 2 story, brick, rein.-con., steel forging plant, plain found., Toledo Ave. $200,000. Private plans.

Neb., North Platte — SHOP — Union Pacific R.R. Co., H. C. Mann, ch. engr., 1415 Dodge St., Omaha, plans 120x250 ft. steel shop.

Neb., Omaha—FILLING STATIONS—Texas Co., Omaha, making plans constructing 2 filling stations, one at 13th and Jackson Sts., and other at 25th and Dodges St. $45,000. Site purchased.

N. J., Irvington—PLANT—J. Roller, 58 Woolsey St., plans plant improvements and equipment on 500 Chancellor Ave. $37,000 or more. Land and building recently required. Architect not appointed.

N. J., Jersey City—PLANT—The Air Reduction Sales Corp., Pacific Ave. and Forest St., acquired six lots, 136 to 146 Halladay St., adjoining its plant on Forest St., and plans plant improvement. To exceed $37,000. **Maturity indefinite.**

N. J., Newark—PLANT—The Third Street Realty Corp., c/o Kingsland Cooperage Co., lessee, 649 North Third St., plans reconditioning former Martin Everett Co. plant, on 273 Emmett St. To exceed $37,000. Property acquired. Architect not appointed.

N. Y., Brooklyn—GARAGE, etc.—D. Weill, 2801 Fort Hamilton Parkway, plans by M. Marlo, 200 Beverly Rd., altering 2 story, brick garage and shop, Grand Ave. near Lexington Ave. $37,000 with equipment.

N. Y., Buffalo—WAREHOUSE—Bardol Co., Inc., Marine Trust Bldg., plans by G. Morton Wolfe, archt., 1377 Main St., 2 story, fireproof warehouse, Court, Georgia and 4th Sts. $450,000. McKesson & Robbins Co., lessee.

N. Y., Maspeth—SERVICE GARAGE, etc.—Q. X. Mathews Co., Lincoln and Roosevelt Aves., Woodside, plans by L. Bubeck, c/o owner, 1 story, 100x100 ft. brick service garage, and shop, Grand Ave. and 79th St. $37,000 with equipment.

N. Y., Maspeth—STORAGE—J. F. Trommer Brewery, 1632 Bushwick Ave., Brooklyn, plans altering, repairing storage, Metropolitan and Woodward Aves. $37,000 with equipment. **Maturity indefinite.** Architect not appointed.

N. Y., New York—STORAGE, etc.—Broadway Impvt. Co., 30 Pine St., plans by G. J. Couchois, 44 West 34th St., constructing 8 story manufacturing and storage building, 845 Bway. $37,000 with equipment.

N. Y., Niagara Falls—FURNACE BUILDING—Union Carbide Co., 137 47th St., soon lets contract constructing Furnace Building 77, North 47th St. Private plans.

N. Y., Schenectady— WAREHOUSE — John Rudd Trucking Co., plans constructing warehouse, destroyed by fire. To exceed $37,000. Architect and engineer not appointed.

★ **N. Y., Solvay** — PLANT — Solvay Process Co., Solvay, plans constructing 7 story, rein.-con. plant addition. To exceed $500,000.

★ **N. Y., Tonawanda**—PLANT, etc.—Linde Air Products Co., 30 East 42nd St., New York, plans constructing 4 story, plant and laboratory, Woodward Ave. $2,000,000. Site acquired.

N. D., Buelah—MINE TIPPLE—Knife River Mining Co., M. C. Blackstun, mgr., Bismarck, plans rebuilding mine tipple, recently destroyed by fire. $50,000.

O., Cincinnati—DISTILLERY—Penn-Maryland Corp., 7818 Anthony Wayne Ave., plans 8 story, basement, brick, rein.-con. new distillery, plain found., Anthony Wayne Ave. $250,000. Private plans.

O., Dayton — FACTORY — Standard Register Co., Campbell St., plans by Austin Co., 16112 Euclid Ave., Cleveland, 1 story, 80x180 ft., steel factory addition, plain found., on Campbell St. $75,000.

O., Defiance—PLANT—Defiance Pressed Steel Co. plans repairing, altering plant. To exceed $150,000. Architect not appointed.

★ **O., Toledo**—PLANT—Standard Oil Co. of Ohio, 526 High St., plans distilling and oil cracking unit (refinery). $1,500,000.

Pa., Harrisburg—STORAGE WAREHOUSE—Standards Brands, 595 Madison Ave., New York, plans improvements to storage warehouse and office. Est. $37,000 with equipment.

Pa., Johnstown—FREIGHT STATION—Baltimore & Ohio R.R. Co., C. H. Lane, ch. engr., Baltimore, Md., plans brick, steel freight station. $200,000. **Maturity before August 1.**

Va., Norfolk—PLANT—Norfolk Newspapers, Inc. (publishers of Ledger-Dispatch and Virginian Pilot), plans by F. Ferguson, Norfolk, for new home on 111x266 ft. site, Brambleton Ave. between Voss St. and National Lane. Est. about $250,000. Site selected. W. Ginsberg, 205 East 42nd St., New York, consult. archt.

Wis., Merrill—FACTORY—Merrill Industrial Foundation, A. Gruett, secy., soon lets contract 3 story, 52x272 ft., brick, steel factory, plain found., G. A. Krasin, Marshfield, archt. Noted June 5, C. D.—June 11, E. N.-R.

Wis., South Milwaukee — FACTORY — Line Material Co. plans addition to factory. $90,000.

Man., Carman—PLANT—Pace Oil Refiners Ltd., W. R. Milton, genl. mgr., plans constructing oil refining plant. $75,000.

Ont., Guelph—FACTORY—Hammond Mfg. Co., L. M. Hammond, mgr., 39 Yarmouth St., plans 1 story, 45x100 ft., brick factory and will instal equipment for manufacturing various radio specialties and supplies, Wellington St.

Ont., Kitchener—PLANT—J. M. Schneider & Sons, 321 Courtland Ave., plans 3 story, basement, 50x60 ft. brick building to be equipped as rendering plant. $50,000. J. C. Klaehn, 49 King St. E., engr.

Ont., New Toronto — BREWERY — Pabst Brewery Corp., Milwaukee, Wis., plans constructing brewery. To exceed $40,000.

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†*Federal Government*

Industrial Buildings (Continued)

Ont., Oshawa—FACTORY—Metcalfe Food Products Ltd., making plans factory, $40,000.

Que., Ville LaSalle — FACTORY — Standard Brands Ltd., 1010 St. Catherine St. W., Montreal, plans by Sydney Comber, 630 Dorchester St. W., Montreal, new factory. $250,000.

BIDS ASKED

Neb., Omaha—LAUNDRY—Cudahy Packing Co., 33rd Ave. and O Sts., taking bids altering and constructing laundry building addition. Est. about $45,000.

N. Y., Long Island City—FACTORY—See "Contracts Awarded."

N. Y., New York—SECTION STATION, etc. —See "Contracts Awarded."

N. Y., New York—FACTORY—See "Contracts Awarded."

★**O., Dayton**—FACTORY—July 1, by Hillsmith & Co., archts., 108 East 3rd St., 1 and 2 story, steel frame, brick, factory addition, also new boilers and steam plant building addition on Abbey Ave., for Inland Mfg. Co., Inland Ave., $750,000.

W. Va., Rivesville—See "Contracts Awarded."

Ont., Kirkland Lake—MILL—See "Contracts Awarded."

CONTRACTS AWARDED

Calif., Oakland — WAREHOUSE — Howard Terminal, 1st and Market Sts., San Francisco, 1 story, steel frame warehouse, 1st and Market Sts., to S. G. Johnson, 4652 Dolores St., $60,000.

Calif., Sacramento — WAREHOUSE — F. E. Barton, archt., Crocker Bldg., San Francisco, 1 story, 80 x 242 ft., steel, concrete warehouse, to C. J. Hopkinson, 1810—28th St., Sacramento, for Bekins Van & Storage Co., Otis St., San Francisco, about $36,500. Noted June 18, C. D. —May 28, E. N.-R.

Calif., San Francisco — PLANT — J. Rosenwald, engr., 525 Market St., general contract rein.-con. publishing plant, 23,000 sq.ft. floor space, Van Ness Ave. and 13th St. S., for Jas. H. Barry Co., 1122 Mission St., to Cahill Bros., 206 Sansome St., $55,000; painting, to D. Zelinsky, 165 Gove St. Noted June 5, C. D. —June 11, E. N.-R.

Calif., San Leandro—FACTORY—F. K. DuPuy, general contractor, 110 Sutter St., San Francisco, sheet metal for factory, Washington Ave., to Richmond Sheet Metal Wks., Richmond, for Friden Calculating Machine Co., 1 Montgomery St., San Francisco***structural steel, to Independent Iron Wks., 821 Pine St., Oakland***rolling doors, to Kinnear Mfg. Co. of California, 361 Brannan St., San Francisco ***masonry, to H. B. Petersen, 1605 Lafayette St., Alameda. Noted May 22, C. D.—May 28, E. N.-R. under "Contracts Awarded."

Conn., Beacon Falls—FACTORY—Homer D. Bronson Co., Beacon Falls, 2 story, 50x85 ft., brick, steel plant addition, to Torrington Building Co., 182 Church St., Torrington. Est. $40,000. Private plans.

Conn., Hartford—R. G. Bent Co., general contractors, 93 Edwards St., Hartford, sprinklers for warehouse, Sequassen St. and Van Dyke Ave., to W. B. Carson, Inc., 220 Sargent St., for Colt Patent Fire Arms Mfg. Co., 17 Van Dyke Ave., S. M. Stone, pres.***plumbing, to John J. Lyons & Son, 240 New Britain Ave.*** steel, to Deslauriers Steel Mold Co., Inc., 6 Beacon St., Boston, Mass. Noted May 18, C. D. —May 21, E. N.-R., under "Contracts Awarded."

Ga., Warrenton — FILLING STATION — Sinclair Refining Co., Atlanta, 1 story, 23x46 ft., rein.-con., structural steel, cast stone, brick filling station, to Poe & Strickland, Louisville. Awarded June 7.

Ill., LaGrange—ELECTRO-MOTIVE PLANT —Electro-Motive Corp., general contract constructing 1 story, 44x240 ft. electro-motive plant addition, to Austin Corp., 510 North Dearborn St., Chicago.

Ind., Fort Wayne — PLANT — Rea Magnet Wire Co., East Pontiac St., constructing plant addition, to Indiana Eng. & Contg. Co., Utility Bldg. Est. $45,000.

Ind., Indianapolis—FACTORY—D. A. Bohlen & Sons, archts., 1001 Majestic Bldg., general contract 2 story, basement, 80x80 ft., glass jar factory addition, South Keystone Ave., for Fairmount Glass Wks., J. H. Rau, pres. and mgr., South Keystone Ave., to Service Constr. Co., P. O. Box 1101, Indianapolis. Est. $50,000. Bids June 8. Noted May 25, C. D.—May 28, E. N.-R.

Ind., Marion — SOY BEAN MILL — Hoosier Soy Bean Mills, Inc., J. H. Caldwell, Jr., mgr., St. Louis, Mo., remodeling and constructing top story addition to soy bean mill, 33rd and Nebraska Sts., to W. A. Edwards, Marion, $32,000. Bids June 11, awarded June 11. Noted May 25, C. D.—May 28, E. N.-R.

La., Ida — PLANT — Rodessa Gasoline Co., Shreveport, 30,000,000 ft. daily capacity gasoline extraction plant, to H. E. Deckard & Co., Monroe, $120,000.

Md., Amcelle — PLANT — Celanese Corp. of America, 180 Madison Ave., New York, 1,400 tons structural steel and 200 tons reinforcing bars for 3 buildings to be built at plant, to Bethlehem Steel Co., Bethlehem, Pa. Noted May 28, C. D.—June 4, E. N.-R., under "Contracts Awarded."

Mont., Heath—PLANT—U. S. Gypsum Co., 300 West Adams St., Chicago, Ill., constructing 40 x 60 x 400 ft. plaster board plant for manufacturing sheet rock and rock lath, to Lovering-Longbotham Co., 605 Builders Exch. Bldg., St. Paul, Minn., and J. Leek, Minneapolis, Minn. Est. $150,000. Bids June 3.

Mont., Kevin—PLANT—Big West Oil Co. of Montana, Hutton Bldg., Spokane, Wash., enlarging crude charging capacity and Dubbs cracking capacity, conversion Dubbs unit from single coil to two oil cracking operation, building light oil cracking furnace, installilng additional hot oil pump, pump house, double cell furnace, for treating and redistilling cracked gasoline, to R. M. Parsons Co., 310 South Michigan Ave., Chicago, Ill.

Mo., St. Louis—WAREHOUSE—Kroger Grocery & Baking Co., 39th and Vista Aves., general contract altering and constructing 2 story, rein.-con., brick warehouse, 39th and Vista Sts., to Fruin-Colnon Contg. Co., 502 Merchants-Laclede Bldg.

N. H., Gonic — PLANT — Gonic Mfg. Co., Gonic, general contract brick, steel, concrete dyehouse and power plant, to A. L. Phelps, Inc., 496 Bridge St., Springfield***structural steel, to Lyons Iron Wks., Inc., 500 Willow St., Manchester***millwork, to Ely Lumber Co., 13 Cabot St., Holyoke, Mass. Est. $37,000. H. G. White, 496 Bridge St., Springfield, Mass., archt.

N. J., Jersey City—PLANT—American Can Co., 230 Park Ave., New York, constructing plant, to Turner Constr. Co., 420 Lexington Ave., New York. Est. exceeds $40,000.

N. J., Newark—WAREHOUSE—L. Bamberger & Co., 131 Market St., altering 6 story, basement, 110x117 ft. warehouse, Bank and Campbell Sts., to R. Howie, Jr., 763 Broad St., $45,000. R. D. Kahn & J. J. Knight, 56 West 45th St., New York, archt. Noted May 11, C. D.

N. J., Orange—FACTORY—Monroe Calculating Machine Co., 555 Mitchell St., constructing 1 story, basement, 107x146 ft., brick, steel factory building and 4 story, 425x645 ft., rein.-con. addition to old building, to Falzler Co. Inc., 1 Hill St., Newark, $40,000 and $30,000 respectively. Noted May 29, C. D.—June 4, E. N.-R.

N. Y., Albany — WAREHOUSE — A. P. W. Paper Co., 1273 Bway., masonry and carpentry for warehouse and office addition, to J. P. Sewell, 372 Hudson Ave. Total est. $150,000. Noted May 8, C. D.—May 14, E. N.-R., under "Contracts Awarded."

N. Y., Buffalo—BREWERY—Iroquois Brewery Corp., 230 Pratt St., 1 and 2 story, 100x100 ft. brewery, Pratt St., separate contracts now being awarded. Taking bids on roofing. J. Schultz & Son, 1370 Main St., archts. Noted May 15, C. D.—May 21, E. N.-R.

N. Y., Corning—PLANT—H. K. Ferguson Co., general contractors, Hanna Bldg., Cleveland, O., 700 tons structural steel for plant addition, to American Bridge Co., Frick Bldg., Pittsburgh, Pa. Noted Apr. 24, C. D.—Apr. 30, E. N.-R., under "Contracts Awarded."

N. Y., Long Island City—FACTORY—P. and D. Realty Co., Inc., 30-02 22nd St., constructing 150x200 ft. factory, 19th Ave. and 38th St., separate contracts. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Long Island City — STORAGE — V. Schiller, archt., 3004 41st St., awarding separate contracts constructing warehouse, 25th Ave. and 47th St., for United Casket Co., 24-33 47th St. Noted May 21, C. D.—May 28, E. N.-R.

N. Y., Maspeth—FACTORY—Starcor Realty Corp., 55-15 Grand St., 2 story, brick factory, 55-15 Grand St., to J. K. Turton Co., Grand Central Terminal, New York. Est. $110,000. L. Davidson, 55 West 42nd St., New York, archt.

N. Y., New York—FACTORY, etc.—Garment Center Capital, Inc., 512 7th Ave., altering 23 story factory and storage, 494 7th Ave., separate contracts. Est. about $40,000. Noted May 12, C. D.—May 28, E. N.-R.

N. Y., New York—SECTION STATION, etc. —Dpt. Sanitation, 125 Worth St., altering section station and service building, 128 West 17th St., relief labor. Est. about $37,000. **W.P.A.** F. B. McDuffee, 125 Worth St., archt.

N. Y., Sherrill—WAREHOUSE—Oneida Community Ltd., Sherrill, general contract warehouse, East Seneca St., to M. C. Morgan, Kenwood. Est. $37,000. Reinforcing steel and structural steel, to Gray Steel Co., 1407 East Erie Blvd., Syracuse. Noted May 21, C. D.— May 28, E. N.-R., under "Contracts Awarded."

O., Cleveland—FACTORY, etc.—Nickel Plate Development Co., H. H. Hampton, pres., Terminal Tower, constructing 1 story, 60x144 ft. brick, steel factory and warehouse, 2760 East 47th St., to J. Tepper Constr. Co., 3468 East 123rd St. G. S. Rider Co., Marshall Bldg., archts. Awarded June 12.

O., New Miami—BLAST FURNACE—Hamilton Coke & Iron Co., J. A. Levett, genl. mgr., constructing blast furnace, incl. high stack, equipment capacity 700 tons per day, to A. G. McKee Co., 2422 Euclid Ave., Cleveland. $300,000.

O., Warren — FACTORY — Packard Electric Co., three 1 story, brick factory buildings, to Hughes & Bowers, Warren. Est. $200,000. Noted June 4, C. D.—June 11, E. N.-R.

Pa., Phila. — PLANT — Paper Manufacturers Co., 5th and Willow Sts., plant addition, to Turner Constr. Co., 420 Lexington Ave., New York. Est. exceeds $40,000.

R. I., Bristol—BOAT STORAGE—Herreshoff Mfg. Co., C. Haffeureffer, mgr., 20 Burnside St., 1 story, 100 x 300 ft., steel boat storage building, concrete found., Burnside St., to International Steel Co., Evansville, Ind., to exceed $37,000. Noted June 5, C. D.—June 11, E. N.-R.

Tenn., Memphis—OIL STORAGE—National Refining Co., 793 Kentucky St., 2 story, basement, 40x86 ft. oil storage plant, to Meers & Wallenta Co., 166 Monroe Ave.; installing 2 tanks, to Newberry Equipment Co., 793 Kentucky St. Total est. $40,000.

Vt., Brattleboro — FACTORY — Brattleboro Shoe Factory, Inc., H. Clark, mgr., 76 Western Ave., 1 and 2 story, 130 x 140 x 215 ft., irregular sized shoe factory, concrete found., to Ernest F. Carlson, Inc., 1694 Main St., Springfield, Mass. Est. $50,000. Bids about June 4, awarded about June 18. Private plans.

★**W. Va., Rivesville**—PLANT—Monongahela West Penn. Pub. Service Co., 50 Broad St., New York, reconditioning steam electric power plant, separate contracts and day labor. $2,000,000. Owner purchasing equipment. Sanderson & Porter, 52 William St., New York, engrs.

Wis., Eau Claire—FACTORY—Gillette Rubber Co., constructing 2nd floor addition, 200x600 ft. and 50x130 ft. factory addition, to Hoeppner-Bartlett Co., Eau Claire. Noted Jan. 17, C. D.—Jan. 25, E. N.-R.

Wis., Fond du Lac—TANNERY—F. Rueping Leather Co., general contract constructing 1 story, 80x84 ft. addition to tannery, to Inundi Constr. Co., Fond du Lac***millwork, to Moore & Galloway Lumber Co., Fond du Lac***reinforcing and structural steel, to Vulian Mfg. Co., Fond du Lac***sheet metal, to Warming Sheet Metal Co., Oshkosh.

Ont., Hamilton—GARAGE—Hutton & Souter, archts., 36 James St. S., general contract constructing 2 story, 138x185 ft. and 51x95 ft. rein.-con., brick, steel, stone garage, office and showroom, for General Motors of Canada Ltd., William St. E., Oshawa, to James Kemp, 45 Barnesdale Ave. S.***plumbing, heating and sprinklers, to Adam Clark Ltd., 7 Main St. W. ***wiring, to Bennie Electric Co., 1137 Main St. W. Est. $125,000. Noted Mar. 27, C. D.— Apr. 2, E. N.-R.

Ont., Kingston — GRAIN ELEVATOR — Municipality completing grain elevator, to James Richardson & Sons, Ltd., Kingston, $62,500.

Ont., Kirkland Lake—MILL—Wright Hargreaves Mine Ltd., R. L. Healey, mgr., constructing addition to mill, day labor, $150,000.

★**Ont., Port Colborne**—PLANT—International Nickel Co. of Canada, Ltd., Bank of Commerce Bldg., Toronto, general contract constructing 95x236 ft. brick, steel plant to replace monel metal boiler and heater building recently burned, 100x800 ft. electrolytic building, 100x300 ft. warehouse, to Fraser Brace Eng. Co., Ltd., 107 Craig St. W., Montreal, Que., structural steel, to Standard Steel Constr. Co., Port Robinson. Est. $1,000,000.

Ont., St. Catherines—FOUNDRY—McKinnon Industries Ltd., Ontario St., subsidiary of General Motors of Canada, Oshawa, 1 story, 60x120 ft., brick, steel power house, to Rowden & Hockey, 51 York St.***175 ft. radial brick chimney, to Francis Hankin Co., 165 Spadina Ave., Toronto***two 500 hp. boilers with stoker equipment, to Babcock Wilcox & Goldie McCulloch Ltd., Galt***brick, steel, gear building and offices, to Tope Constr. Co., 677 Main St., Hamilton, and Standard Steel Constr. Co., Port Robinson, $381,000. Noted Jan. 28, C. D.—Jan. 30, E. N.-R.

Ont., Toronto—BOILER HOUSE—Canadian Kodak Co. Ltd., Mount Dennis, masonry for 3 story, brick, rein.-con. boiler house, to James A. Wickett Ltd., 16 Saulter St., structural steel, to Dominion Bridge Co. Ltd., 1139 Shaw St., wiring, owner's staff. Noted May 25, C. D.— May 28, E. N.-R.

Ont., Toronto—FACTORY—W. Davidson & Co. Ltd., general contractor, 188 Duke St., elevator for 3 story, brick, steel addition to present factory, for United Drug Co. Ltd., 68 Broadview Ave., to Turnbull Elevator Co. Ltd., 126 John St. Noted May 25, C. D.—May 28, E. N.-R.

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For official proposal advertising see Searchlight Section

†*Federal Government*

Two more slices coming off the hillside.

981½ HOURS—5,666 LOADS

To move hillsides, Swords-McDougal Company put their faith in Le Tourneau Carryalls and have recently found that faith profitably justified. To cut down an East Peoria (Illinois) hillside, they worked three Le Tourneau 12-Yard Carryalls, a Rooter and Angledozer with "Caterpillar" RD8 tractors, filled the excavated material into a new real estate development. Hauling conditions were decidedly good—10% down grade for 700 feet—even so, the performance of the Le Tourneau equipment was striking—5,666 heaping loads in 981½ tractor hours on a round-trip haul that was never less than 4,000 feet, and frequently 4,750 feet.

Fast, steady operation, the result of stout construction and Le Tourneau cable control, made this performance possible, is today increasing profits for hundreds of other Le Tourneau owners the country over.

Ask your "Caterpillar" tractor dealer to show you what Le Tourneau equipment can do for you.

Manufacturers of: Angledozers, Buggies, Bulldozers, Carryall Scrapers, Cranes, Drag Scrapers, Power Control Units, Rooters, Semi-Trailers.

Rolling in high with a heavy load to the fill.

R. G. LE TOURNEAU, INC.

PEORIA, ILLINOIS STOCKTON, CALIFORNIA

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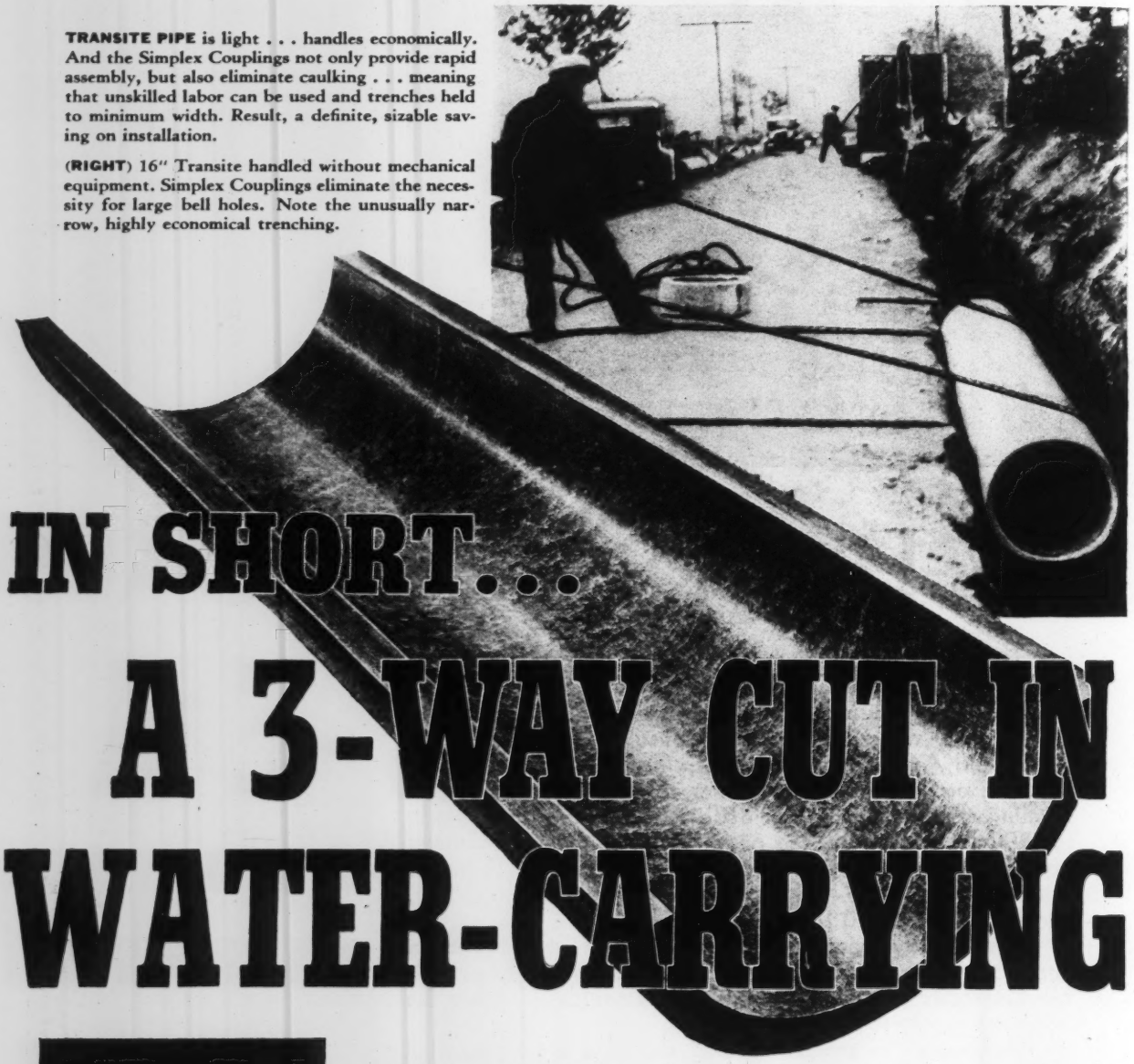
LE TOURNEAU

SAVES ON INSTALLATION . . .

TRANSITE PIPE is light . . . handles economically. And the Simplex Couplings not only provide rapid assembly, but also eliminate caulking . . . meaning that unskilled labor can be used and trenches held to minimum width. Result, a definite, sizable saving on installation.

(**RIGHT**) 16" Transite handled without mechanical equipment. Simplex Couplings eliminate the necessity for large bell holes. Note the unusually narrow, highly economical trenching.



IN SHORT . . .

A 3-WAY CUT IN WATER-CARRYING

Johns-Manville
TRANSITE PRESSURE PIPE
JM
An ASBESTOS Product

REAL ECONOMY in water transportation begins *after* your pipe is purchased.

Any one pipe that can cut installation charges; virtually eliminate maintenance and very sizably reduce pumping costs throughout its long years of service—is a pipe that guarantees true economy as a water carrier.

A high standard, yes—but not too high for Transite Pipe, as the facts quickly prove.

INSTALLATION: Relatively light, there is a decided saving each time Transite is handled. (On all but the very largest sizes no mechanical equipment is needed.) And there is the added economy of Simplex Couplings which require no caulking and are rapidly assembled by unskilled labor.

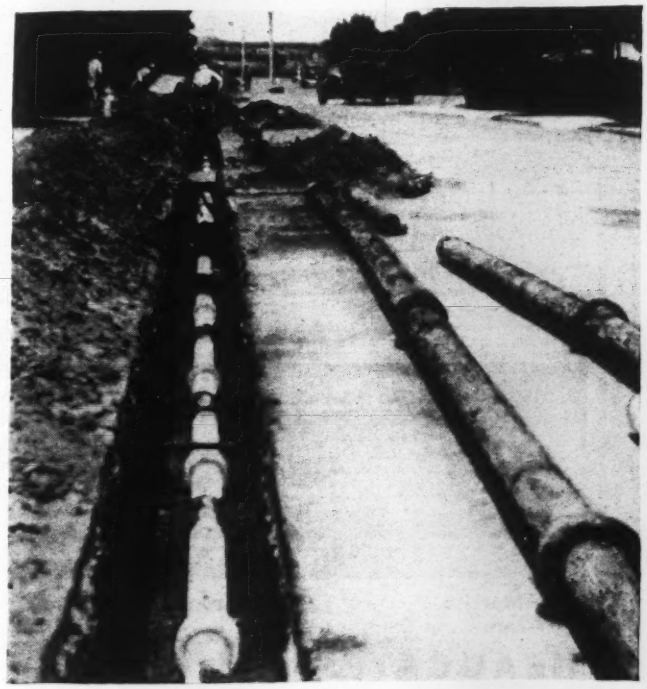
MAINTENANCE: Permanent by the very nature of its asbestos-cement composition, Transite Pipe is immune to electrolysis and tuberculation, exceptionally resistant to all corrosive soil conditions. Hence it provides a major safeguard against costly shutdowns and renewals.

PUMPING COSTS: Transite's immunity

SAVES ON MAINTENANCE . . .

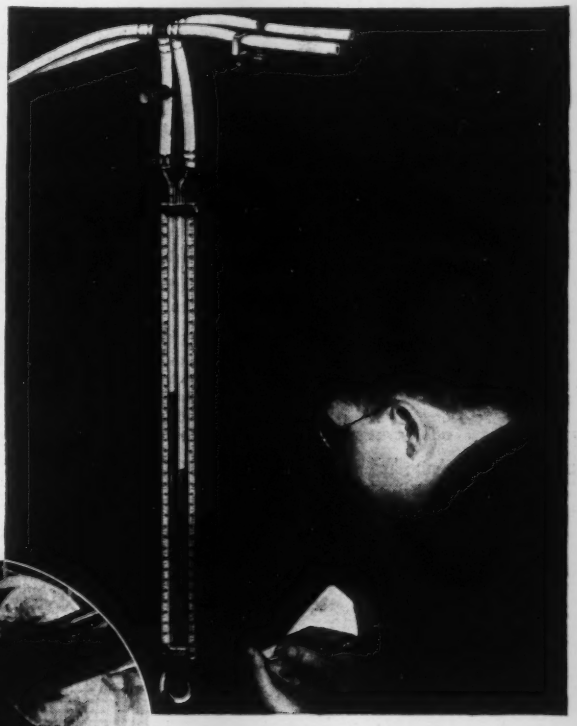
TRANSITE PIPE, because of its asbestos-cement composition, is permanent, immune to electrolysis. Cannot tuberculate. Is unaffected by acid or alkaline soil conditions. Hence, it offers freedom from cleaning expense, costly shutdowns and renewals.

(BELOW) Permanently ending the ravages of soil corrosion by installing Transite Pipe. An asbestos-cement product, Johns-Manville Transite Pressure Pipe is remarkably resistant to such destructive agencies.



SAVES ON PUMPING COSTS

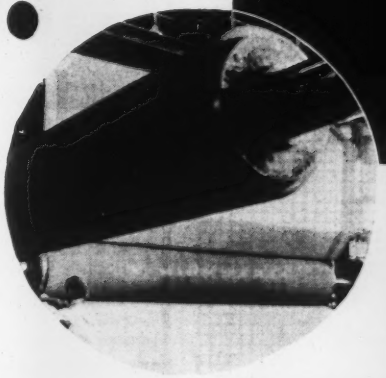
TRANSITE PIPE cannot tuberculate. Conservatively estimated, its flow coefficient is C-140—and this high initial delivery capacity is maintained indefinitely. Consider the savings possible in operating expense, the tremendous proportions they assume when you realize that it costs nearly twice as much to pump against a coefficient of 100 as against Transite's constant C-140.



COSTS!

to tuberculation gives absolute assurance that its high initial delivery capacity will be indefinitely maintained. Its conservatively estimated flow coefficient of C-140 stays pegged at that figure. And therefore, pumping costs stay permanently low.

In short, Transite Pipe effects the 3-way cut in water-carrying costs that promises you a permanently economical pipe line. Send for our illustrated brochure, covering in detail all the advantages Transite offers to water transportation. Johns-Manville, 22 E. 40th Street, New York City.



(ABOVE) "Flow coefficient 145," says the pitometer in this test of 1500 ft. of Transite Pipe from a city main into an industrial plant. **(LEFT)** One of the huge machines on which Transite Pressure Pipe is formed . . . and which is responsible for an interior smoothness that offers minimum frictional resistance to water flow.

JOHNS-MANVILLE, 22 East 40th Street, New York City
Send me the Transite Pipe Brochure.

Name_____ Organization_____

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ENG-6-36

INSURING SAFETY
IN MAKING TAPS
UNDER PRESSURE

FOR making taps under pressure into pipe lines for branch connections by the use of the Smith Tapping Machine either a Smith Tapping Sleeve or a Smith Hat Flange and in either case a Smith Tapping Valve must be used.

Shown above is our Hackensack Sleeve with which only the ends need leading and caulking. It is made extra strong throughout. We also furnish other types of sleeves for various requirements.

Smith Tapping Valves are made with the openings through their seat-rings 3/16" larger than standard and with their ends bored concentric with those rings, so as to provide perfect alignment of the tapping machine shaft and its cutter.

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THE A. P. SMITH MFG. CO.
EAST ORANGE, N. J.

SMITH
TAPPING VALVES

WRIGRAPH
PRECISION
DRAFTING MACHINE

. . . . GUARANTEED ACCURACY—instrument workmanship. Brief case and drawing room models. Interchangeable drawing attachments to suit your drawing needs. PORTABLE MODEL instantly fastened to any flat wood surface for accurate drawings up to 20"x26".

Assembled with solid Phosphor Bronze Bearings.

L. G. WRIGHT, INC.
5213 Euclid Ave. Cleveland, Ohio

We Look Into the Earth
By using Diamond Core Drills.
We prospect Coal and Mineral Lands.
We are fully equipped for testing foundations for bridges, dams, buildings, and all work of a similar character.
Pennsylvania Drilling Co.
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Hayward Buckets

This Drag-Line Bucket digs at any angle, at any depth, on any length of boom.
THE HAYWARD CO., 48-50 Church St., N.Y.

Bevel Mortise Gears
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HEADGATES and HOISTS
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Elevating Graders, Drags, Road Graders, Motor Graders, Road Rollers, Road Mix Machines, Culverts, Dump Cars, Dump Wagons, Scarifiers, Bulldozers, Trailers, Scrapers, Plows, Crushing and Washing Plants, Sweepers and Sprinklers, Shovels, Cranes, Snow Plows, Bituminous Distributors, etc. Write for complete information.
Austin-Western
ROAD MACHINERY
The Austin-Western Road Machinery Co., Aurora, Ill.
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Air operated vibrators for all classes of concrete construction including Bridge deck slabs, Dams and Locks, Highway pavement and Concrete products. Write for circulars and engineering data.
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Only Reliable Products Can Be Continuously Advertised

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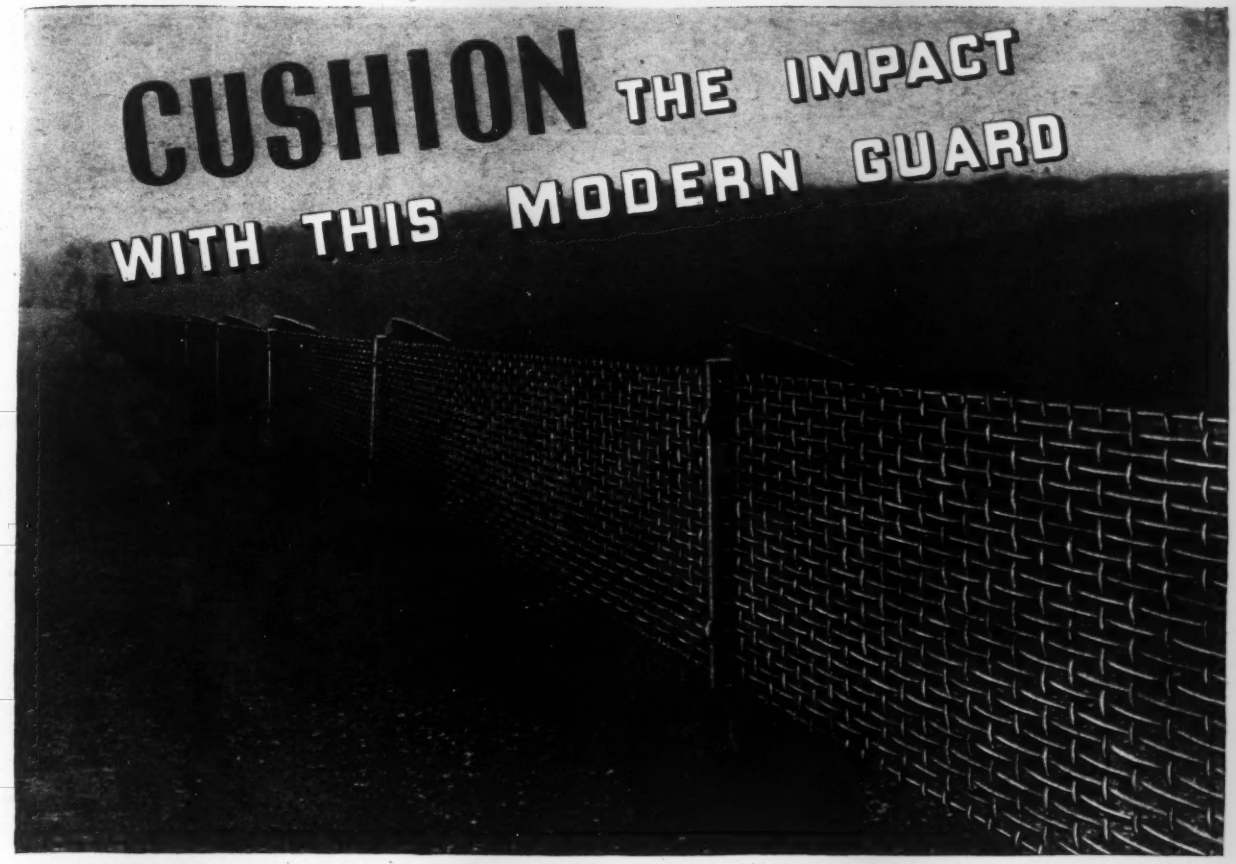

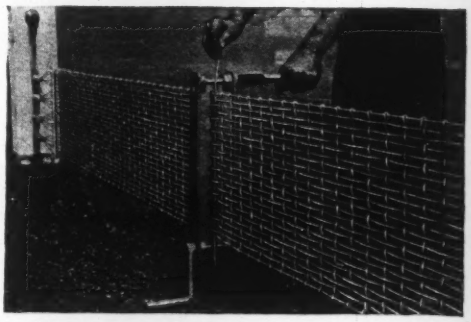

Pittsburgh Safety Highway Guard is seldom injured by collision beyond the slight displacement of transverse wires. Repairs are quickly made on the spot by unskilled labor, at negligible cost.

Pittsburgh Safety Highway Guard is a strong, slightly resilient, 14-inch band woven with continuous longitudinal semi-spring steel wires having tensile strength exceeding 190,000 pounds per square inch. The shock of any impact is distributed throughout the entire length of the guard, thus saving both vehicle and guard from serious damage. The guard's ultimate breaking strength of 45 tons is ample to stop the heaviest vehicle. A survey of Pittsburgh Safety Highway Guard under actual service conditions has been made by Pittsburgh Testing Laboratory. A summary of their report is available on request.

Pittsburgh Safety HIGHWAY GUARD

PITTSBURGH STEEL COMPANY

741 UNION TRUST BUILDING, PITTSBURGH, PENNSYLVANIA

New York Chicago Detroit Memphis Houston St. Louis
Syracuse Philadelphia San Francisco Los Angeles

Pittsburgh Steel Co., 741 Union Trust Bldg., Pittsburgh, Pa.
Gentlemen:
Please send me, free, a summary of Pittsburgh Testing Laboratory's report on Pittsburgh Safety Highway Guard.

Name ..... Title .....

Address .....

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● These four yielding bands with tremendous tensile strength save lives and prevent wrecks at this beautiful scene. Drivers appreciate this protection, and so do taxpayers. PAGE traffic TAPE is economical in the first place and lasts a long time. Contractors like its adaptability, easy erection and maintenance. Public officers approve because available funds provide more mileage of protected highway, and even their approval is protected because PAGE traffic TAPE invites competitive tests of efficiency.

PAGE STEEL & WIRE DIVISION OF THE AMERICAN CHAIN COMPANY, INC., MONESSEN, PENNSYLVANIA

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Leschen Wire Rope

Tell us how you use wire rope and we shall be glad to suggest the right rope for best results.

A. Leschen & Sons Rope Co.
Established 1857
5909 Kennerly Ave., St. Louis, Mo.

Chicago — New York

The WHEELED ROLLER

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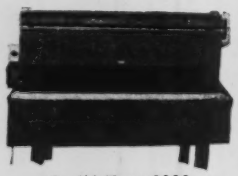

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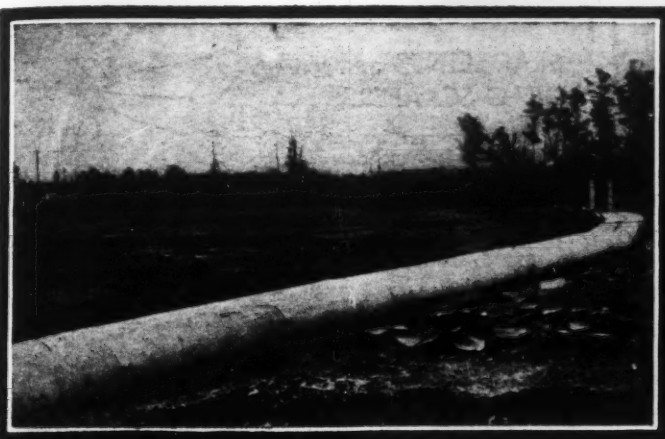

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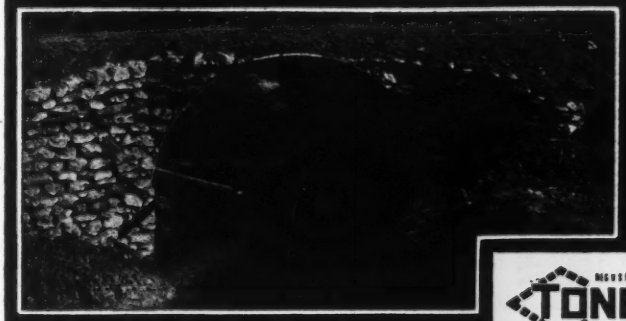

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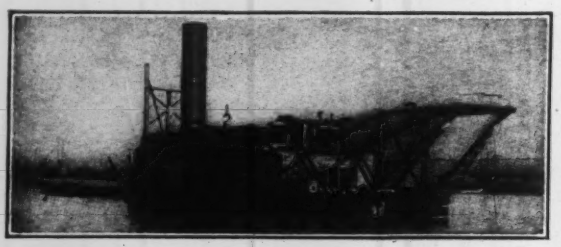

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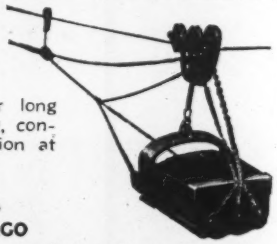

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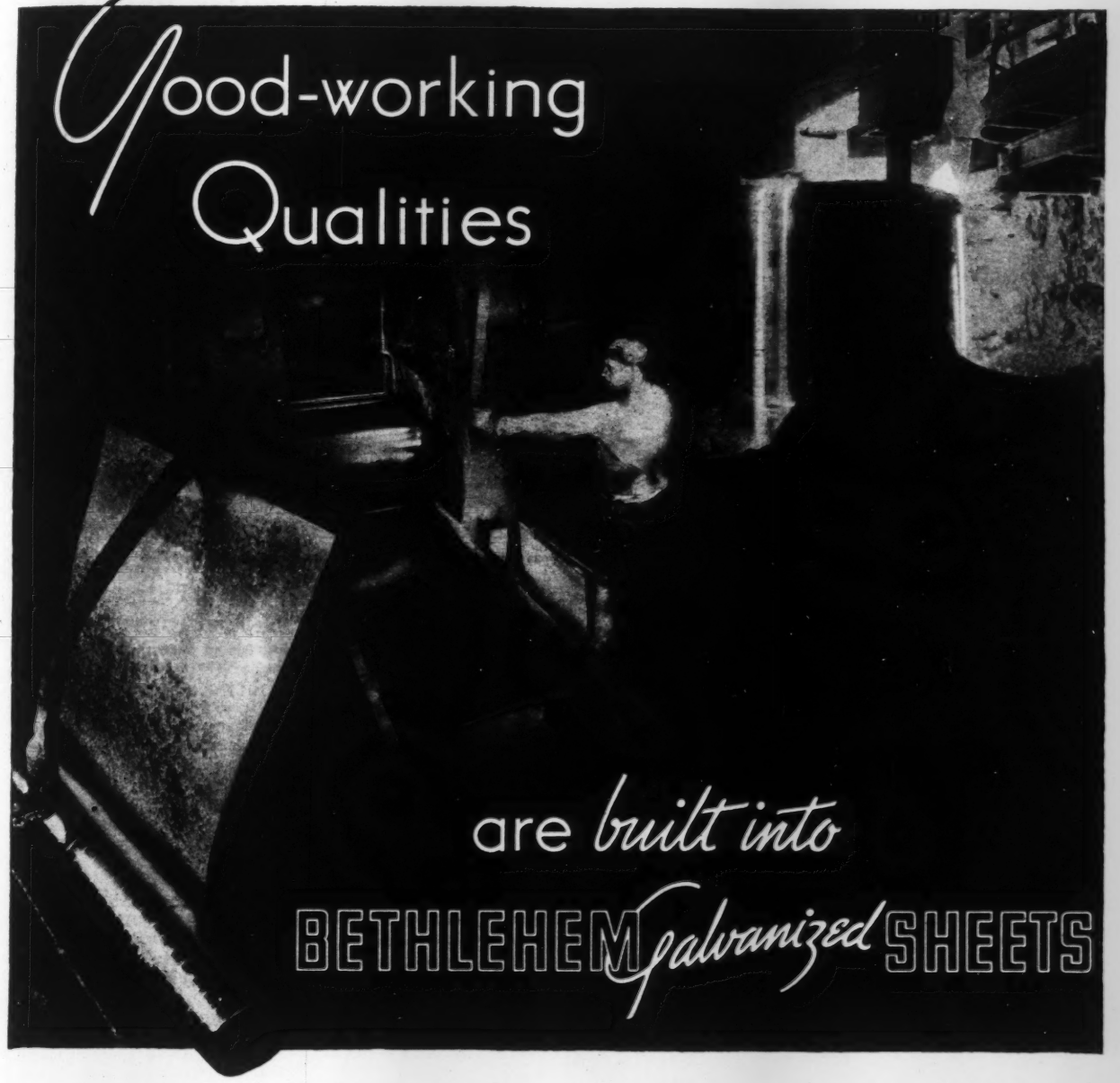

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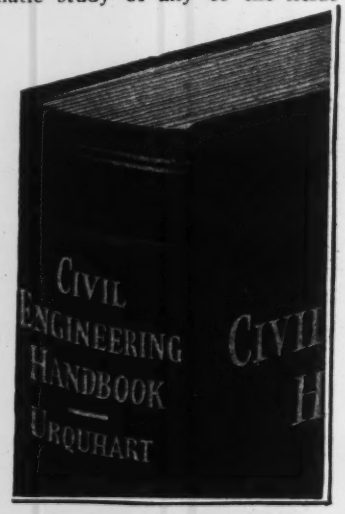

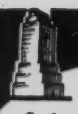

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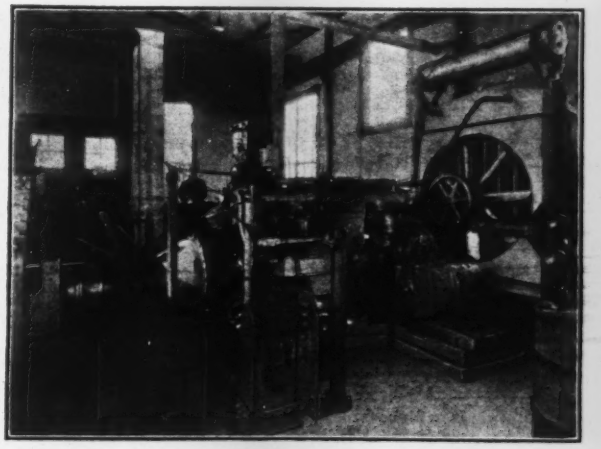
The engine referred to operates a four M.G.D. high lift pump against 125 pounds pressure and is a very satisfactory unit."



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The strength of the sturdy oak is not all above the ground. The oak depends upon its roots for life and growth. So with Pomona Pumps. It's not what you see above the ground that alone makes Pomona a great pump. Of course, it's recognized that there isn't a sturdier, better engineered pump head built, but that's only the half of it. It's the assembly of shafting, bearings, impellers and bowls that are hidden from passing gaze that are Pomona's roots. Here lies the secret of Pomona's superior performance, long life and trouble-free operation. The high quality material, the meticulous machining, the precision fittings found in the bowl assembly of Pomona Pumps is seldom equalled,—has never been excelled. You are *paying* for Pomona performance. Be sure your pump is Pomona,—then you will *get it.*

Write for your copy of Pomona's new engineering circular on hydraulic laboratory pump testing.

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SEARCHLIGHT SECTION

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Copy: Official Proposals reaching our New York Office by 10 A. M., Wednesday, can usually be printed in the issue out Thursday. Holidays advance this time one day.

Rate:

40 Cents a Line an Insertion

Fractional lines count as full lines

Advertisers may file *Plans and Specifications* at any of our offices without charge, for the inspection of prospective bidders. Notice of such filing should appear in the advertisement specifying the offices at which they are available.

THESE ARE OFFICIAL NOTICES THAT BIDS ARE WANTED FROM BIDDERS EVERYWHERE

E. N.-R.

OFFICIAL PROPOSALS

Bids: June 30.

State Highway Work

STATE DEPARTMENT OF PUBLIC WORKS

DIVISION OF HIGHWAYS
ALBANY, N. Y.

Sealed proposals will be received by the undersigned at the State Office Building, 13th Floor, Albany, N. Y., until one o'clock p.m., advanced standard time, which is twelve o'clock noon eastern standard time, on Tuesday, June 30, 1936, for the reconstruction of highways and bridges in the following counties, in accordance with the rules and regulations for carrying out the provisions of the Emergency Relief Appropriation Act of 1935 (Public Resolution No. 11-74th Congress).

County	Deposit Required
WASHINGTON	$ 680
—COMPLETION— (105' Truss Bit. Mac. MM. Type 3 App.: 0.07 mile)	
ORANGE	4,900
(20' Concrete 8" including 100' Girder over N. Y. O. & W. RR.: 0.46 mile)	
STEUBEN	5,100
(42' I-Beam Concrete App.: 0.97 mile)	

Maps, plans, specifications, and estimates may be seen and proposal forms obtained at the office of the Division of Highways in Albany, N. Y., and at the office of the District Engineers in whose district the roads are located, upon the payment of Five Dollars ($5.00) for plans and proposal forms. Standard specifications are Two Dollars ($2.00) per copy. No refund will be made on plans, specifications or proposal forms. Plans and proposal forms may also be seen at the office of the State Department of Public Works, State Office Building, Worth and Center Streets, New York City. The addresses of the District Engineers and Counties in each district will be furnished upon request.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specifications, and contract agreement. The attention of bidders is also directed to the special provisions covering sub-letting or assigning the contract and to the use of domestic materials, when let under the rules and regulations for carrying out the provisions of the Emergency Relief Appropriation Act of 1935 (Public Resolution No. 11-74th Congress) for the purpose of providing employment and hastening industrial recovery.

Proposal for each highway or contract must be submitted in a separate sealed envelope with the name and number of the highway plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check; payable to the order of the New York State Department of Public Works, Division of Highways, for the sum as specified in the advertisement for proposals and the proposal itself for each project. The retention and disposal of such cash, draft or check by the State Division of Highways shall conform with Subdivision 2 of Section 38 of the Highway Law, as amended. The successful bidder will be required to execute the contract and comply in all respects with Sec. 38 of the Highway Law, as amended. The amount of the certified check accompanying the proposal of the bidder to whom the contract is awarded will be returned when ten percentum of the work under the contract has been completed. If Surety Bond is dispensed with, in pursuance to the Highway Law, the amount of the bidding check will be returned when fifteen percentum of the contract work has been completed.

On contracts with federal funds, when optional types are permitted for any one item of work, contractors must state in the space provided in the proposal for this purpose the exact designation of the optional type upon which the proposal is predicated. No one proposal shall contain more than one bid for an optional item. The award, if made, will be on the basis of the responsible proposal which for all items of work gives the lowest total cost for the project and the contract will call for the type designated in such proposal.

Skilled, Intermediate Grade, and Unskilled Labor on all projects shall receive the minimum wage rate per hour as follows:

In New York City: Skilled Labor, eighty cents per hour; Intermediate Grade Labor, sixty-five cents per hour; Unskilled Labor, fifty-five cents per hour; in the Counties of Nassau, Rockland, Suffolk and Westchester; —Skilled Labor, seventy-five cents per hour; Intermediate Grade Labor, sixty cents per hour; Unskilled Labor, fifty-five cents per hour; in the Counties of Dutchess, Orange, Putnam, Ulster & Sullivan, seventy-five cents per hour for Skilled Labor; Intermediate Grade Labor, Fifty-five cents per hour; Unskilled Labor, fifty cents per hour; and in all other counties other than above, Skilled Labor, seventy-five cents per hour; Intermediate Grade Labor, fifty-five cents per hour; Unskilled Labor, Forty-five cents per hour.

The minimum hourly rate of wages for the various types of operations and trades, as well as the hours of work and conditions of employment, shall be set forth under the Special Provisions in the itemized proposal for each project.

In conformity with the provisions of Section 220, Sub-division d, of the State Labor Law, as amended, the minimum hourly rate of wages has been established and is annexed to and forms a part of the specifications for the project, and may be ascertained upon reference to the proposal for the project itself.

The right is reserved to reject any or all bids.

FRED'K STUART GREENE,
SUPT. STATE DEPT. PUBLIC WORKS

Water Works System Extensions

PWA DOCKET NO. N. Y. 1004 R
WEBSTER, N. Y.

Attention is directed to advertisements appearing in the Webster, New York Herald and the Rochester Democrat & Chronicle under dates of June 18th and 25th, inviting proposals for

Contract A. Furnishing Cost, iron water pipe and special costings—Estimate, $66,218.49.

Contract B. Furnishing valves and boxes —Estimate, $2,530.02.

Contract C. Furnishing hydrants—Estimate $2,400.00.

Contract D. Construction of water lines —Estimate, $30,541.75.

Copies of the contract papers may be examined at the office of Meloy Smith, Engineer, 16 State Street, Rochester, and copies thereof may be obtained upon payment of $3.50 for contracts A. B, and C, and $7.50 for contract D, which payments will not be returned.

WILSON H. O'DELL,
Village Clerk.

U. S. Government

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 10, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 p.m., July 9, 1936, for furnishing all labor and materials and performing all work for *construction of Psychiatric Ward, National Home for Lepers at Carville, La.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (2510)

U. S. DEPARTMENT OF AGRICULTURE, Bureau of Public Roads, Washington, D. C., June 9, 1936. SEALED BIDS will be received at the office of the Bureau of Public Roads, Gaines Building, Hot Springs, Arkansas, until 11 o'clock, a.m., C.S.T., July 9, 1936, for *furnishing and placing of earth cover on shoulders and slopes of road on West Mountain and on former road location on that mountain, Project 1A2, Hot Springs National Park, Garland County, Arkansas.* It is anticipated that this will involve 14,000 cu.yd. earth cover. Minimum rates of wages which must be paid laborers and mechanics on this project have been fixed by the Secretary of Labor as required by law. Where plans and specifications are requested, a deposit of $10.00, certified check or cash, will be required to insure their return within 15 days after opening of bids. Checks must be made payable to the Treasurer of the United States. Plans, specifications and proposal forms may be obtained at the office of the Bureau of Public Roads, 1725 F Street, N.W., Washington, D. C., or at the Gaines Building, Hot Springs, Arkansas. H. J. Spelman, District Engineer. (257)

UNITED STATES ENGINEER OFFICE, 615 Commerce Bldg., St. Paul, Minnesota.—Sealed bids for *constructing Dam No. 9*, Mississippi River, near Lynxville, Wisconsin, will be received in this office until 11:00 A. M., central standard time, July 7, 1936, and then publicly opened. Further information upon application. (2422)

U. S. ENGINEER OFFICE, Jacksonville, Fla.—Sealed bids, in duplicate, will be received here until 2:00 o'clock p.m., July 1, 1936, and then publicly opened, for furnishing all labor and materials and performing all work for *dredging* approximately 1,200,300 cu.yds. of material, place measurement, in widening and deepening channel at inlet and across Indian River and deepening and widening turning basin at Ft. Pierce Harbor, Fla. Further information on application. (2418)

OFFICIAL PROPOSALS

Bids: July 1.

Reinforced Concrete Foundation for Diesel Engine No. 6

ELECTRIC LIGHT DEPARTMENT,
VILLAGE OF ROCKVILLE CENTER,
NASSAU COUNTY, NEW YORK

Sealed proposals will be received by the Board of Trustees of the Incorporated Village of Rockville Centre, Nassau County, New York, at the office of the Village Clerk, Municipal Building, Rockville Centre, New York, until 8 o'clock P. M., Daylight Saving Time, on the 1st day of July, 1936, at which time and place they will be publicly opened and read, for furnishing cement, sand, broken stone, scrap iron, rinforcing steel rods, reinforcing steel beams, and T-rails, building forms, and constructing reinforced concrete foundation for a 2,900 B.h.p. Diesel Engine and direct connected generator.

Information for Bidders, form of proposal, and form of contract, including specifications, may be examined at the office of the Commissioner of Public Utilities, Municipal Building, Rockville Centre, New York, and copies may be obtained upon the deposit of $10.00. The amount of the deposit will be refunded to each bidder who returns the documents in good condition within thirty (30) days after the opening of bids. The time allowed for doing and completing the work is forty-two (42) consecutive calendar days.

The Board of Trustees of the Village of Rockville Centre hereby reserves the right to waive informalities in any bid, or reject any or all bids, or to accept the one that in its judgment will be for the best interests of the Village, all subject to the approval of the State Director, Federal Emergency Administration of Public Works.

Before the contract is approved by the State Director, the Contractor will be required to furnish a breakdown of his estimate showing labor costs, material costs, and other costs in detail, in form satisfactory to the State Director.

A bid bond or a certified check made payable to the order of the Incorporated Village of Rockville Centre, New York, in the amount of five per centum (5%) of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, he will within ten days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder. The check or bid bonds of all excepting the three lowest formal bidders will be returned within ten days after the opening of bids, while the remaining checks or bid bonds will be returned when the State Director has approved the executed contract.

The successful bidder will be required to furnish a performance bond satisfactory to the Board of Trustees of the Incorporated Village of Rockville Centre and approved by the State Director, in the full amount of the contract. No bidder may withdraw his bid within 45 days after the date set for the opening thereof.

This contract is to be financed wholly by loan and grant by the Federal Emergency Administration of Public Works and is subject to the provision of the National Industrial Recovery Act and to the Rules and Regulations prescribed by the President of the United States, or the Administrator of the Federal Emergency Administration of Public Works.

The attention of bidders is particularly called to the requirement as to the conditions of employment to be observed and minimum wage rates to be paid under this contract, as well as to other provisions set forth in the form of bid.

SIGNED: HORACE L. ALLEN,
Mayor.

Dated Rockville Centre, New York.
June 12th, 1936.

Bids: July 6.

Elimination of Grade Crossing

JOHN STREET—ELM PARK,
STATEN ISLAND, N. Y.

Sealed proposals for grading, construction of bridge, etc., account of elimination of grade crossing at John Street, Elm Park, Staten Island, N. Y., will be received by the Chief Engineer of The Staten Island Rapid Transit Railway Company, E. & O. Central Building, Baltimore, Md., until eleven (11) A. M. (E.S.T.), Monday, July 6th, 1936, at which time and place they will be publicly opened and read.

The estimated cost of this contract is $100,000.

Plans, specifications and other forms of contract documents, as well as form of contract bond, may be examined at office of Assistant Engineer, S.I.R.T. Ry., Stapleton, S. I., or at office of Principal Assistant Engineer, Baltimore, Md. Copies may be obtained by application to either office and payment of $10.00 in cash or by check payable to "H. A. Lane, Chief Engineer," of which no refund will be made.

The Staten Island Rapid Transit Railway Company reserves the right to waive any informalities in or to reject any or all bids. No bid will be accepted, however, except with the prior approval of the State Engineer, Federal Emergency Administration of Public Works.

Each bidder must deposit with his bid security in an amount of not less than five per centum (5%) of the base bid in the form and subject to the conditions provided in the Information for Bidders.

The successful bidder will be required to furnish a contract bond in such form and having as surety thereon such surety company or companies as are approved by the undersigned and said State Engineer, in the amount of not less than 100% of the total amount of the accepted bid.

This contract is to be financed in part by a grant by the Federal Emergency Administration of Public Works, and is subject to the provisions of Title II of the National Industrial Recovery Act and to the Executive Orders of the President issued pursuant thereto, and to the rules and regulations prescribed by the President of the United States or the Federal Emergency Administrator of Public Works.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the contract.

No bidder may withdraw his bid within 45 days after the date set for the opening thereof.

H. A. LANE,
Chief Engineer.

The Staten Island Rapid Transit Railway Company

June 25th, 1936.

Bids: July 6.

Sewage Treatment Plant

Radnor Township, Wayne, Pa.

Sealed proposals for furnishing, installing and testing Mechanical Equipment in the proposed Sewage Treatment Plant, Contract No. 2, will be received by the Board of Commissioners of Radnor Township at the Radnor Township Building, 212 E. Lancaster Ave., Wayne, Pa., until 7:00 P.M. Eastern Standard Time (8:00 P. M. Eastern Daylight Saving Time) July 6, 1936, at which time and place the sealed proposals will be publicly opened and read.

All bids shall be submitted on the blank form of proposal, bound in the specifications, and shall give the price of each item of the work proposed. All proposals shall be delivered in sealed envelopes, marked with the name of the bidder and submitted to the undersigned Township Secretary at the Radnor Township Building, Wayne, Pennsylvania.

No bidder may withdraw his bid for a period of sixty days after the date set for the opening thereof.

The Instructions to Bidders, Form of Bid, Form of Contract, Drawings, Specifications, Construction Regulations, Performance Bond, Labor and Materialmen's Bond may be examined at the Radnor Township Office, 212 E. Lancaster Ave., Wayne, Pa. and at the office of the Secretary of Haverford Township, Oakmont, Pa. and copies thereof obtained at the office of Charles F. Mebus, Consulting Engineer, 112 S. Easton Road, Glenside, Pa. on or after June 19, 1936 upon payment of $25.00 for each set. The payment made by any bidder will be refunded if such documents are returned in good condition within five days after the opening of bids. If the Plans and Specifications are not returned to the Engineer as stated, the entire amount of the deposit will be forfeited. Other deposits will be refunded with deduction not exceeding the actual cost of reproduction ($7.41) of the drawings, upon the return of all documents in good condition within thirty days after date of opening of bids.

The Board of Commissioners of Radnor Township reserves the right to waive any informalities in or to reject any or all bids. Award of contracts will be subject to the approval of the State Director (Pa.) Federal Emergency Administration of Public Works.

The minimum wage rates permissible in this project shall be in accordance with the schedule of minimum rate in the specifications, and as approved by the State Director P.W.A. (Pa.)

Attention of Bidders is particularly called to the requirements as to conditions of employment to be observed.

Each proposal or bid must be accompanied by cash or a certified check made payable to Radnor Township or a bid bond with surety satisfactory to the Township in an amount not less than ten percentum (10%) of the bid price.

This project is being financed in part by funds furnished by the Federal Emergency Administration of Public Works and all requirements of the Public Works Administration P.W.A. Form 200, August 12, 1935 and any amendments thereto, together with all other requirements of the Public Works Administration must be adhered to.

Work shall be started on this contract not later than five days after the notification by the Owner to start work. The entire project shall be completed, ready for use by December 1, 1936. The provisions of the foregoing shall be covered by a liquidated damage clause.

No bid will be considered unless accompanied by a letter from Activated Sludge, Inc., 141 West Jackson Boulevard, Chicago, Illinois, substantially in the form of the latter as set forth in Article 12 of the General Conditions of the Specifications.

No proposal will be considered unless properly executed in writing.

L. W. HUMMEL,
Secretary
Radnor Township.

Bids: June 30.

Vocational School

SCHOOL DISTRICT OF PHILADELPHIA
THE BOARD OF PUBLIC EDUCATION
21ST STREET AT PARKWAY

Sealed proposals addressed to the Committee on Property will be received at the office of the Secretary and Business Manager of The Board of Public Education, 21st Street, at Parkway, until 2 p.m., E.S.T., June 30, 1936, for the following:

NEW VOCATIONAL SCHOOL
Lehigh Avenue between 21st and 22nd Streets

Construction of Vocational School Building, including general work (except demolition and foundations), metal lockers, hardware, plumbing, eating, ventilating, electrical and elevators, at which time and place the sealed proposals will be publicly opened and read.

This project is being financed in part with funds provided by the Federal Emergency Administration of Public Works and all requirements of the Public Works Administration P.W.A. Form No. 179, July 22, 1935, and any amendments thereto together with all other requirements of the Public Works Administration must be adhered to.

The minimum wage rates to be paid on this project shall be in accordance with the schedule of minimum rates in the specifications, and as approved by the State Director.

No bidder may withdraw his bid for a period of thirty days after the date set for the opening thereof.

Each bidder must submit a sworn financial statement and a sworn performance record, both of which must either accompany his bid or must be furnished within forty-eight hours after the bids have been opened.

A deposit of Twenty-five Dollars ($25.00) will be required of each bidder to obtain copies of plans and specifications for each of the above contracts, the said deposit will be refunded upon return of the plans and specifications in good condition.

All information as to bonds, specifications, bidding blanks, etc., can be obtained at the above address.

The Board of Public Education reserves the right to reject any or all bids and make the award to the best interests of the School District of Philadelphia, subject to the approval of the State Director (P.W.A.).

ADD B. ANDERSON,
Secretary and Business Manager.

OFFICIAL PROPOSALS

Bids: July 6.

Gas Engine Driven Centrifugal Pumping Units and Accessories

CLARKSBURG, WEST VIRGINIA

Sealed proposals for furnishing and installing in the present pumping station two gas engine driven centrifugal pumping units, one 4 m.g.d. capacity at 350 foot head and one 4 m.g.d. capacity at 35 foot head, including foundations and piping, will be received by the Water Board, Clarksburg, West Virginia, at the office of Scotland G. Highland, Secretary and General Manager, until 1 P.M. Eastern Standard Time, July 6, and at that time will be opened and read in the presence of the bidders.

Copies of the plans, instructions to bidders, proposal, contract form and specifications may be examined by the prospective bidders at the office of the Clarksburg Water Board and may be obtained at the office of Fuller & McClintock, 11 Park Place, New York City, at a price of $10.00 per set with no refund.

Each bid must be accompanied by a certified check in the sum of Five Hundred Dollars ($500.00) and the successful bidder will be required to furnish an acceptable surety bond for the full amount of the contract.

The work will be financed by regular Water Board revenues.

SCOTLAND G. HIGHLAND,
Secretary and General Manager.

Bids: July 13.

State Highway Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 25, SECTION 24

Construction of Route 25, Section 24, from Burlington to Crystal Lake, Burlington County, length 5.911 miles.

Estimated:

102,859 cu.yds. roadway excavation unclassified
16,161 cu.yds. borrow excavation
2,490 cu.yds. wet excavation
65,031 sq.yds. removal existing conc. pavement
151,946 sq.yds. 9" rein. conc. pavement
2,180 sq.yds. 9" plain conc. pavement
1,824 cu.yds. concrete in bridges
56,650 lbs. reinforcement steel in bridges
1,425 lbs. structural steel in bridges

Bids for the above will be received at the office of the State Highway Department, State House Annex, Trenton, N. J., on Monday, July 13, 1936, at eleven o'clock Eastern Standard Time, twelve o'clock Noon, Daylight Saving Time, and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed work is a "Regular Federal Aid Project" under the provisions of Section 4 of the Federal Act of June 18, 1934 (H.R. 8781) known as the Hayden-Cartwright Act, and is to be performed in accordance with the Special Provisions and requirements of the United States Department of Agriculture, Bureau of Public Roads, as outlined in the Supplementary Specifications to be made a part of the contract and specifications, which provisions require that labor be employed from lists furnished by the National Reemployment Service, 55 Main Street, Mt. Holly, N. J. The attention of the bidders is directed to the Special Provisions covering subletting or assigning the contract and to the use of Domestic Materials. The minimum wage paid to all skilled labor employed on this contract shall be $1.20 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be 65c per hour. The minimum wage paid to all unskilled labor employed on this contract shall be 40c per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made on the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal form and special addressed envelopes will be furnished on application. Bids not enclosed in special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: E. DONALD STERNER,
State Highway Commissioner

Bids: July 13.

State Highway Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

Notice is hereby given that sealed bids will be received by the State Highway Commissioner for:

ROUTE 44, SECTIONS 2A, 4A and 7

Construction of Route 44, Sections 2A, 4A and 7, from Oldman's Creek to Penns Grove, Salem County. Length 4.635 miles.

ESTIMATED:

18,720 cu.yds. roadway excavation unclassified
10,874 cu.yds. borrow excavation.
55,440 sq.yds. 9" rein.-conc. pavement surface
190 sq.yds. 18" conc. pavement surface
3.1 tons bituminous concrete pavement, Type FA-BC-1, Type A, or Type T.

Bids for the above will be received at the office of the State Highway Department, State House Annex, Trenton, N. J., on Monday, July 13, 1936, at eleven o'clock, Eastern Standard Time, twelve o'clock Noon, Daylight Saving Time, and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification law and the regulations adopted by the State Highway Commissioner. Bidders must submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed work is a "Regular Federal Aid Project" under the provisions of Section 4 of the Federal Act of June 18, 1934 (H.R. 8781) known as the Hayden-Cartwright Act, and is to be performed in accordance with the Special Provisions and Requirements of the United States Department of Agriculture, Bureau of Public Roads, as outlined in the Supplementary Specifications to be made part of the contract and specifications, which provisions require that labor be employed from lists furnished by the National Reemployment Service, Room 1, P. O. Building, Millville, N. J. The attention of bidders is directed to the Special Provisions covering subletting or assigning the contract and to the use of Domestic Materials. The minimum wage paid to all skilled labor employed on this contract shall be $1.20 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be 65c. per hour. The minimum wage paid to all unskilled labor employed on this contract shall be 40c. per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made on the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosesd in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal form and special addressed envelopes will be furnished on application. Bids not enclosed in special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: E. DONALD STERNER,
State Highway Commissioner.

Bids: July 6.

Filter Equipment

Pryor, Oklahoma.

Sealed bids will be received until 8:00 p.m., July 6, 1936, by the Mayor and Council of Pryor Creek, Oklahoma, for complete filter and water treating equipment for two units of 250,000 g.p.d. each.

Plans and specifications may be seen at the office of the City Clerk, Pryor, Oklahoma, or upon receipt of $2 by the city clerk, plans, specifications and bidding blanks will be mailed to any interested.

All bids for the above mentioned material must be upon uniform bidding blanks and must be accompanied by certified check for 5% of the amount bid; said five per cent to be forfeited to the City of Pryor Creek in the event satisfactory bond and contract are not made by the successful bidder.

Upon the date above mentioned at 8:00 p.m. the Mayor and Council will publicly open and read any bids submitted, and they reserve the right to reject any or all bids.

(Signed) C. L. SAMUEL,
Mayor.

ATTEST:
WM. P. SHETLEY, City Clerk.

U. S. Government

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 11, 1936. —Sealed proposals in duplicate will be publicly opened in this office at 1 p.m., July 10, 1936, for furnishing all labor and materials and performing all work for *construction of the U. S. P. O. at Oak Hill, W. Va.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (2512)

U. S. ENGINEER OFFICE, 13TH FLOOR, CUSTOMHOUSE, BOSTON, MASS.—Sealed bids will be received here until 12 M., D.S.T., June 30, 1936, and then opened, for *removal of concrete bridge pier* on north bank of Cape Cod Canal, Mass. Further information on application. (255)

U. S. ENGINEER OFFICE, 13TH FLOOR, CUSTOMHOUSE, BOSTON, MASS.—Sealed bids will be received here until 12 M. D.S.T., July 2, 1936, and then opened, for *grading slopes and placing revetment, excavating ditch and placing pile culvert, at Cape Cod Canal, Mass.* Further information on application. (256)

U. S. ENGR. OFFICE, 13TH FLOOR, CUSTOMHOUSE, BOSTON, MASS.—Sealed bids will be received here until 12 M. D.S.T., July 10, 1936, and then opened, for *dredging* approximately 518,100 cubic yards, scow measurement of material, in Weymouth Fore River, Mass. Further information on application. (259)

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U. S. Government

PROCUREMENT DIVISION, PUBLIC WORKS BRANCH, Washington, D. C., June 9, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., July 8, 1936, for furnishing all labor and materials and performing all work for *construction of the U.S.P.O. at Chelsea, Mich.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (258)

U. S. ENGINEER OFFICE, Milwaukee, Wis.—Sealed bids will be received at this office until July 10, 1936, and then publicly opened for *constructing* 810 *ft. pile pier and removing* 237 *ft. old piers at Leland Harbor, Mich.* (2412)

OFFICIAL PROPOSALS

Bids: July 14.

State Highway Work

STATE DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
ALBANY, N. Y.

Sealed proposals will be received by the undersigned at the State Office Building, 13th Floor, Albany, N. Y., until one o'clock p.m. advanced standard time, which is twelve o'clock noon eastern standard time, on Tuesday, July 14, 1936, for the construction and reconstruction of highways and bridges in the following counties, in accordance with the rules and regulations for carrying out the provisions of the Emergency Relief Appropriation Act of 1935 (Public Resolution No. 11-74th Congress).

Construction

County	Deposit Required
ERIE (41' M.M. Special: 1.45 miles)	$12,400
MONTGOMERY (10' Gravel-Bit. Treated: 6.57 miles)	4,500
STEUBEN (18' Gravel incl. 180' Truss: 0.19 mile)	3,000
(Waterproofing, sheet metal work Built-Up Roofing, roof drains, & Skylight-Storage Bldg.)	300
SULLIVAN (16' Gravel Bit. Treated: 3.94 miles)	5,200
YATES (2-16' slabs, 3-12' slabs, Gravel Appr.: 0.51 mile)	2,900

Reconstruction

ALBANY (30' M.M. 3 1.01 miles)	3,500
GREENE (18' M.M. 3 8.20 miles)	10,500
HERKIMER (20' Concrete-8-7-8: 3.32 miles)	10,500
JEFFERSON (Widen & Strengthen 51' I-Beam Concrete approach: 0.03 mile)	800
ORLEANS (Truss Br. 320' span with two 40' Girder appr. spans; Concrete appr: 0.85 mile)	8,700
(16.5' Arch Culvert-No appr.:)	700
RENSSELAER (20' Bit. Mac. Mixed In place: 4.93 miles)	7,400
WASHINGTON (20' Bit. Mac. Mixed in Place: 7.20 miles)	9,700
WYOMING (10x10 Box; 12x20 Box; MM. 4 Appr. & Widen shoulders: 0.08 mile)	3,800

Maps, plans, specifications, and estimates may be seen and proposal forms obtained at the office of the Division of Highways in Albany, N. Y., and at the office of the District Engineers in whose district the roads are located, upon the payment of Five Dollars ($5.00) for plans and proposal forms. Standard specifications are Two Dollars ($2.00) per copy. No refund will be made on plans, specifications, or proposal forms. Plans and proposals forms may also be seen at the office of the State Department of Public Works, State Office Bldg., Worth & Center Streets, New York City. The addresses of the District Engineers and Counties in each District will be furnished upon request.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specifications, and contract agreement. The attention of bidders is also directed to the special provisions covering sub-letting or assigning the contract and to the use of domestic materials, when let under the rules and regulations for carrying out the provisions of the Emergency Relief Appropriation Act of 1935 (Public Resolution No. 11-74th Congress) for the purpose of providing employment and hastening industrial recovery.

Proposal for each highway or contract must be submitted in a separate sealed envelope with the name and number of the highway plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check, payable to the order of the New York State Department of Public Works, Division of Highways, for the sum as specified in the advertisement for proposals and the proposal itself for each project. The retention and disposal of such cash, draft or check by the State Division of Highways shall conform with Subdivision 2 of Section 38 of the Highway Law as amended. The successful bidder will be required to execute the contract and comply in all respects with Sec. 38 of the Highway Law, as amended. The amount of the certified check accompanying the proposal of the bidder to whom the contract is awarded will be returned when ten percentum of the work under the contract has been completed. If Surety Bond is dispensed with in pursuance to the Highway Law, the amount of the bidding check will be returned when fifteen percentum of the contract work has been completed.

On contracts with federal funds, when optional types are permitted for any one item of work, contractors must state in the space provided in the proposal for this purpose the exact designation of the optional type upon which the proposal is predicated. No one proposal shall contain more than one bid for an optional item. The award, if made, will be on the basis of the responsible proposal which for all items of work gives the lowest total cost for the project and the contract will call for the type designated in such proposal.

Skilled, Intermediate Grade, and Unskilled Labor on all projects shall receive the minimum wage rate per hour as follows:

In New York City: Skilled Labor, eighty cents per hour; Intermediate Grade Labor, sixty-five cents per hour; Unskilled Labor, fifty-five cents per hour; in the Counties of Nassau, Rockland, Suffolk and Westchester; —Skilled Labor, seventy-five cents per hour; Intermediate Grade Labor, sixty cents per hour; Unskilled Labor, fifty-five cents per hour; in the Counties of Dutchess, Orange, Putnam, Ulster & Sullivan, seventy-five cents per hour for Skilled Labor; Intermediate Grade Labor, Fifty-five cents per hour; Unskilled Labor, fifty cents per hour; and in all other counties other than above, Skilled Labor, seventy-five cents per hour; Intermediate Grade Labor, fifty-five cents per hour; Unskilled Labor, Forty-five cents per hour.

The minimum hourly rate of wages for the various types of operations and trades, as well as the hours of work and conditions of employment, shall be set forth under the Special Provisions in the itemized proposal for each project.

In conformity with the provisions of Section 220, Sub-division d, of the State Labor Law, as amended, the minimum hourly rate of wages has been established and is annexed to and forms a part of the specifications for the project, and may be ascertained upon reference to the proposal for the project itself.

The right is reserved to reject any or all bids.

FRED'K STUART GREENE,
Supt. State Dept., Public Works.

U. S. Government

U. S. ENGINEER OFFICE, 2nd District, 39 Whitehall Street, New York City.—Sealed bids will be received until 11:00 a.m., E.D.S.T., July 6, 1936, and then publicly opened for furnishing all labor and materials and performing all work for *dredging* approximately 54,000 cubic yards of earth material (overburden) and 415,000 cubic yards of ledge rock from New York and New Jersey Channels, near the west end of Kill Van Kull. (2416)

U. S. ENGINEER OFFICE, First New Orleans District, New Orleans, La.—Sealed bids, in duplicate, will be received until 2 p.m., July 9, 1936, and then publicly opened, for furnishing all labor and materials and performing all work for the *construction and delivery afloat at Harvey, La., of one all-welded steel, self-propelled, Mechanical Hyacinth Destruction Plant.* Further information on application. (2511)

U. S. ENGINEER OFFICE, Milwaukee, Wis. Sealed bids will be received at this office until 3 p.m., July 2, 1936, and then publicly opened for *removing old dam and constructing new dam at Menasha, Wis.* (231)

U. S. ENGINEER OFFICE, Clock Tower Building, Rock Island, Illinois. Sealed bids, in duplicate, will be received at this office until 2:00 P. M., C.S.T., July 21, 1936, and then publicly opened, for furnishing all plant, labor and materials for, and *constructing Dam No. 21,* Mississippi River, vicinity of Quincy, Illinois. Further information on application. (254)

U. S. Government

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 15, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., July 21, 1936, for furnishing all labor and materials and performing all work for *construction (except elevators) of the U.S.P.O. and Court House, Cincinnati, Ohio.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $35 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (268)

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 16, 1936.—Sealed bids in duplicate will be publicly opened in this office at 1 P.M., July 22, 1936, for furnishing all labor and materials and performing all work for *construction of the U. S. Inspection Station at Sasabe, Ariz.* Drawings and specifications, not exceeding one set, may be obtained at this office in the discretion of the Assistant Director of Procurement, Public Works Branch. W. E. REYNOLDS, Assistant Director. (265)

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 16, 1936.—Sealed bids in duplicate will be publicly opened in this office at 1 P.M., July 17, 1936, for furnishing all labor and materials and performing all work for *construction of the U. S. Inspection Station at Beebe Plains, Vt.* Drawings and specifications, not exceeding one set, may be obtained at this office in the discretion of the Assistant Director of Procurement, Public Works Branch. W. E. REYNOLDS, Assistant Director. (266)

TENNESSEE VALLEY AUTHORITY, KNOXVILLE, TENNESSEE. Sealed bids, in duplicate, will be received until 10 A.M., Central Standard Time, July 14, 1936, and then publicly opened, for furnishing and delivering *belt conveying equipment* including Structural Steel Supporting Structures for Wilson Dam Fertilizer Works. Bidding documents, for which there is no charge, available June 22, 1936 at the above office. C. H. Garity, Director of Purchases. (267)

UNITED STATES ENGINEER OFFICE, 615 Commerce Bldg., St. Paul, Minnesota.—Sealed bids for *constructing Earth Fill Dike No. 9, Mississippi River*, near Lynxville, Wisconsin, will be received in this office until 11:00 A.M., C. S. T., July 8, 1936, and then publicly opened. Further information upon application. (269)

U. S. ENGR. OFFICE, 13th Floor, Customhouse, Boston, Mass.—Sealed bids will be received here until 12 M. D.S.T., July 1, 1936, and then opened, for *constructing roadways around U. S. Engineer Sub-office at Buzzards Bay, in Bourne, Mass.* Further information on application. (2610)

U. S. ENGINEER OFFICE, Clock Tower Building, Rock Island, Illinois.—Sealed bids, in duplicate, will be received at this office until 11:00 a.m., July 6, 1936, and then publicly opened, for furnishing and delivering f.o.b. Engineer Depot, Arsenal Island, Rock Island, Illinois, complete and ready for installation, *thirty two (32) auxiliary automatic mechanical brakes for the lock operating machinery* at Lock and Dam Nos. 10, 11, 12, 16, 18, 20, 21 and 22, Mississippi River. Further information on application. (2612)

U. S. ENGINEER OFFICE, Milwaukee, Wis. Sealed bids will be received at this office until July 9, 1936, and then publicly opened for *constructing caisson and rubble mound breakwater* at Port Washington, Wis. (2421)

U. S. Government

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 16, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., July 16, 1936, for furnishing all labor and materials and performing all work for *construction complete of the U.S.P.O. at South Orange, N. J.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $7 per set, which will not be returned. Checks offered as payment for drawings, and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (2611)

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 16, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., July 15, 1936, for furnishing all labor and materials and performing all work for *construction of the U.S.P.O. at Beaver Falls, Pa.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $10 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (2613)

SEALED BIDS will be received at the U. S. Engineer Office, Room 932 U. S. Post Office Building, Canal and Van Buren Streets, Chicago, Illinois, until 10:00 A.M., E.S.T., July 15, 1936, and then publicly opened, for furnishing all plant, labor and materials and performing all work for *dredging* and disposing of about 218,000 cubic yards, scow measurement, of material from the Chicago River and the North Branch of the Chicago River, Chicago, Ill. Further information on application. (2615)

SEALED BIDS will be received at the U. S. Engineer Office, Room 932 U. S. Post Office Building, Canal and Van Buren Streets, Chicago, Illinois, until 10:00 A.M., E.S.T., July 16, 1936, and then publicly opened for furnishing all plant, labor, and materials and performing all work required for *dredging* and disposing of 196,000 cubic yards, place measurement, of material other than ledge rock from the Outer Basin at Michigan City Harbor, Indiana. Further information on application. (2616)

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 16, 1936.—Sealed bids in duplicate will be publicly opened in this office at 1 P.M., July 15, 1936, for furnishing all labor and materials and performing all work for *construction of the U. S. Inspection Station at Ferry, Wash.* Drawings and specifications, not exceeding one set, may be obtained from this office in the discretion of the Assistant Director of Procurement, Public Works Branch. W. E. REYNOLDS, Assistant Director. (2614)

U. S. Government

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 18, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., July 20, 1936, for furnishing all labor and materials and performing all work for *construction of the U.S.P.O. at Monett, Mo.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (261)

PROCUREMENT DIVISION, Public Works Branch, Washington, D. C., June 18, 1936.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., July 17, 1936, for furnishing all labor and materials and performing all work for the *construction of the U.S.P.O. at Roxboro, N. C.* Attention is directed to the special conditions of bidding set forth in the specification. Upon application, one set of drawings and specificatfons will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any subcontractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. REYNOLDS, Assistant Director of Procurement, Public Works Branch. (262)

UNITED STATES ENGINEER OFFICE, Room 710, Army Building, 39 Whitehall St., New York, N. Y.—Sealed bids will be received until 12 M. (Daylight Saving Time), July 7, 1936, and then publicly opened, for furnishing all labor and materials and performing all work for *removing and satisfactorily disposing of approximately* 213,815 cubic yards of ledge rock and approximately 271,965 cubic yards of material other than ledge rock in Harlem River, N. Y. (2413)

U. S. ENGINEER OFFICE, Jacksonville, Fla.—Sealed bids, in duplicate, will be received here until 10:00 o'clock a.m., July 2, 1936, and then publicly opened, for furnishing all labor and materials and performing all work for *dredging* approximately 251,700 cu.yds. of material to complete channel and turning basin at Port of Pal Beach, Lake Worth Inlet, Fla., and for performing, if required, certain maintenance dredging in existing portions of channel and turning basin. Further information on application. (2414)

U. S. ENGINEER OFFICE, 2nd District, 39 Whitehall Street, New York City.—Sealed bids will be received until 11:00 a.m., E.D.S.T., July 8, 1936, and then publicly opened for furnishing all labor and materials and performing all work for *dredging* approximately 967,000 cubic yards of material from Shrewsbury River, N. J., extending from Sandy Hook Bay to 600 feet South of Railroad bridge at Highlands, N. J. (2415)

OFFICIAL PROPOSALS

Bids: July 3.

Administration Bldg., etc.

HENRY HUDSON PARKWAY AUTHORITY

New York, N. Y.

SEALED BIDS WILL BE RECEIVED BY the Henry Hudson Parkway Authority, Room 301, Arsenal Building, Central Park, 64th Street and Fifth Avenue, Manhattan, New York City, until 2 p.m., Eastern Standard Time (3 p.m., daylight saving time), on

FRIDAY, JULY 3, 1936

and not thereafter, and at that time the bids will be publicly opened and read.

FOR THE CONSTRUCTION OF THE ADMINISTRATION BUILDING AND TOLL-BOOTHS ON THE HENRY HUDSON PARKWAY.

The work will consist of construction of the Administration Building, toll booths, relay room and other incidental work as specified.

The time allowed for completion of the work under this contract is October 15, 1936.

The bond required for the faithful performance of the contract will be for the full estimate contract price of the contract awarded.

Plans, specifications, general provisions and form of bid, bond and contract for the work are on file at the Arsenal Building, Central Park, 64th St. and Fifth Avenue, Manhattan, New York City, where copies may be obtained upon payment of the sum of $5, no part of which will be refunded. Plans are also on file at the office of Madigan-Hyland, Consulting Engineers, 521 Fifth Ave., Manhattan.

All bids must be made upon blank forms attached to the specifications, and accompanied by a certified check in accordance with the schedule given in the contract documents.

The Henry Hudson Parkway Authority reserves the right to reject any and all bids.

HENRY HUDSON PARKWAY AUTHORITY,
W. EARLE ANDREWS,
Chief Engineer.

U. S. Government

U. S. ENGINEER OFFICE, 2nd District, Room 615, Army Building, 39 Whitehall Street, New York, N. Y. Sealed bids will be received until 11:00 A. M., E.D.S.T. July 17, 1936, and then publicly opened for furnishing all labor and materials and performing all work for *dredging* approximately 157,000 cubic yards of mud and sand from Shoal Harbor and Compton Creek, N. J., extending from deep water in Sandy Hook Bay to Main Street Bridge. (253)

SEALED PROPOSALS will be opened by the Superintendent of Lighthouses, 3760 East Jefferson Ave., Detroit, Michigan, 2 p.m., July 13, 1936, for *erecting five (5) wood pile and timber groins*, Whitefish Point Light Station, Chippewa County, Whitefish Point, Michigan. Information upon application. (264)

U. S. ENGINEER OFFICE, 1068 Navy Building, Washington, D. C. Sealed proposals will be received here until 3 P.M., July 10, 1936, and then opened, for *dredging* approximately 188,500 cubic yards of material from *Rappahannock River, Va.* Further information on application. (263)

Notice to Advertisers

Because of the Holiday, Independence Day, July 4th, the "Searchlight" pages of the

July 2nd issue of ENGINEERING NEWS-RECORD

close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

FINAL CLOSING TIME
Proposals: Tuesday 10 A.M. June 30th

OFFICIAL PROPOSALS

Bids: July 10.

Sanitary-Sewer Extensions

TOMS RIVER
DOVER TOWNSHIP-OCEAN COUNTY, N. J.

Sealed proposals for the construction of Sanitary-Sewer Extensions in Toms River, Dover Township, Ocean County, New Jersey, will be received at the Dover Township Municipal Building in Toms River, until 8:00 P. M., Eastern Daylight Saving Time, Friday, July 10th, 1936, at which time and place they will be publicly opened and read.

Proposals shall be endorsed on the envelope "Proposal for the construction of Sanitary-Sewer Extensions in Hyers St. and in the Montray Park Section of Toms River, Dover Township, Ocean County, N. J., and addressed to The Township Committee of the Township of Dover in the County of Ocean, Toms River, N. J., and must be accompanied by a certified check for the sum of ten (10) per cent of the amount of the proposal, as a guarantee that if the bid is accepted the contract will be executed within ten days thereafter and satisfactory bond be furnished.

Proposals must be made on the blank forms of proposal furnished, and in accordance with all the terms and conditions set forth in Instructions to Bidders attached thereto.

Specifications and plans may be obtained from Earl E. Sousley, Township Engineer, Pine Beach, N. J., and from the Township Clerk, Toms River, N. J., upon payment of the sum of Ten ($10.00) Dollars for each set, said sum so paid to be refunded upon the return of the plans and specifications in good condition.

The Township Committee reserves the right to reject any or all bids.

The estimated cost of this project is $15,400.00.

DOVER TOWNSHIP COMMITTEE
THEODORE FISCHER,
Township Clerk.
EARL E. SOUSLEY,
Engineer.

Bids: July 21.

Chicago Park District

Chicago, Ill.

Sealed proposals endorsed "Proposal for Completion of the Outer Drive Improvement, South Portion" will be received by the Secretary of the CHICAGO PARK DISTRICT, in the Administration Building of the DISTRICT, in Burnham Park, Chicago, Illinois, until two (2:00) o'clock P.M., prevailing Chicago time July 21, 1936 and will be opened and read publicly at that time by the Commissioners of said DISTRICT.

These proposals are invited for the furnishing of all necessary labor and material, for having and using all necessary tools and equipment and for the completion, except for electrical work, of the Outer Drive Improvement from Monroe Street to the Chicago River Bridge in Chicago, Illinois, all in accordance with plans and specifications prepared by the CHICAGO PARK DISTRICT. The work involves grading, sewer, water and conduit lines, reinforced concrete deck slabs, incasement of steel, walls, walks, stairways and other structures, ornamental stone masonry and balustrades, water-proofing, paving and many incidental and appurtenant items.

Bids for all of the work or for various sub-divisions thereof will be considered, as indicated on the proposal form.

This work is financed in part by a grant by the Federal Emergency Administration of Public Works and must be carried out in accordance with the "Rules and Regulations Relating to Applicants and Projects under the Emergency Relief Appropriation Act of 1935," P. W. A. Form No. 179 dated July 22, 1935, and amendments thereto.

All employees directly employed on this work shall be paid wages in no case less than the predetermined scale of wages. This scale of wages is in accordance with the P. W. A. Construction Regulations included in the specifications.

Proposals shall be made upon blank forms furnished by the CHICAGO PARK DISTRICT. These forms, plans and specifications may be examined at the office of the Chief of the Purchasing Division of said DISTRICT and may be obtained upon the deposit of One Hundred Dollars ($100.00) for each set (consisting of the forms, specifications and plans).

Upon the return, intact, of said documents, within ten days after an award of contract or the rejection of proposals, refund in full will be made of the deposit

OFFICIAL PROPOSALS

for one set. A refund of sixty dollars ($60.00) for each additional set will be made. The amount retained on each additional set will be that necessary to cover cost of blue-printing or otherwise duplicating the drawings for the set.

It is the intention to award the contract or contracts to the lowest responsible bidder, or bidders.

The Chicago Park District hereby reserves the right to reject any or all proposals, or to accept any proposal or part of a proposal that in its judgment will be for the best interests of the public, all subject to the approval of the Project Engineer, Federal Emergency Administration of Public Works.

To this end, that combination of acceptable total bids (whether involving one or more than one bidder) which will result in the lowest price for all of the work covered by the Subdivisions noted in the proposal form, taken as a whole, will form the basis for the awarding of the contract or contracts.

A certified check made payable to the order of the Chicago Park District or cash in the amount of five (5) per cent of the aggregate amount of the bid must be deposited by each bidder with his bid as a guaranty that in case the contract is awarded to him he will, within ten days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so he shall forfeit the deposit as liquidated damages and not as a penalty, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder. No bidder may withdraw his bid for a period of thirty days after the date set for the opening thereof. The deposited cash or checks of all excepting the three lowest formal bidders will be returned within thirty days after the opening of bids, and the remaining checks or cash will be returned when the executed contract is approved.

The successful bidder will be required to furnish a performance bond in the amount of the contract, satisfactory to the Chicago Park District and approved by the Project Engineer, Federal Emergency Administration of Public Works.

CHICAGO PARK DISTRICT
By E. A. JULIUS,
Chief of the Purchasing Division.

Dated: June 23,

Bids: July 10.

Rehabilitation West Haven Sewer Plant

PWA Project No. Conn. 1121-R

TOWN of WEST HAVEN, Connecticut invites sealed proposals for enlargement and improvement of its sewage disposal plant, in four sections: (1) General Construction; (2) Equipment; (3) Electrical; and (4) Outfall—separately or in any combination; to be received by the UNDERSIGNED at the TOWN HALL until 2:00 P. M., DAYLIGHT time, Friday, July 10, 1936, and then publicly opened and read aloud.

Plans, specifications, Information for Bidders and forms of Proposal, Bid Bond, Contract and Performance Bond may be examined at the office of the Selectmen or of the Consulting Engineer, Alexander Potter, 50 Church Street, N. Y. C., and sets obtained for deposits as follows: All, $25.00; No. 1 or 2, $15.00; No. 3 or 4, $10.00; two sets of specifications being included. To bidders deposits will be returned in full upon return of plans and one set of specifications in good condition; to others, one-half.

Bid security in an amount not less than 10 per cent of the base bid for each section bid on shall be deposited with the bid—in the form and under the conditions given in the Information for Bidders. No bid may be withdrawn prior to thirty (30) days after the date of opening thereof.

OWNER reserves the right to reject any or all bids and to waive any informalities therein. No award will, however, be made without the prior approval of the State Director, Federal Emergency Administration of Public Works, whose requirements shall govern. Attention of bidders is particularly called to said requirements as to conditions of employment to be observed and minimum wage rates to be paid; and also to employing workmen referred by the U. S. Re-employment Service, or by such agency as the Works Progress Administrator may designate.

By Order Board of Selectmen,
(Signed) ELMER E. SCRANTON,
Clerk.

June 25, 1936.

(Continued on page 67)

POSITIONS VACANT

HYDRO ELECTRIC EXPERT. Long established engineering company can make permanent room for an executive engineer with highest grade experience in responsible charge of power-house design and hydro-electric development. Position requires extensive background in promotional, designing and operating phases. Utility company experience useful but not essential. Replies must be complete and will be held strictly confidential. P-374, Engineering News-Record, 330 West 42d Street, New York City.

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AMERICAN ENGINEERS SERVICE, 15 Park Row, New York. General Contractors, Consultants and Industrial executives, staff engineers, designers, estimators, draftsmen (50), surveymen, inspectors (industrial), Great Lakes, Gulf, Western regions. Factories, Mills, Chemicals. Refineries, Mining, Substations, Sewage Plants, Railway—Highway—Irrigation structures.

POSITIONS WANTED

CIVIL ENGINEER, designer of waterworks and sewerage systems, desires position with American manufacturer or sales agency in Brazil. Previous experience in Brazil. PW-381, Engineering News-Record, 330 West 42d Street, New York City.

CONTRACTOR'S superintendent. Wide experience superintendent, general superintendent sewer systems, heavy sewers, sewage disposal, waterworks, excavation, paving, general construction. Graduate engineer. Has handled large projects. Experienced estimator. Capable, reliable. Now employed. PW-391, Engineering News-Record, 520 No. Michigan Ave., Chicago, Ill.

GENERAL foreman, experienced excavating, sheeting, foundations, retaining walls, bridges, placing steel, placing concrete; has a record for low cost on forms and carpenter work. References A-1. Any place. PW-387, Engineering News-Record, 330 West 42d Street, New York City.

CONTRACTOR'S ENGINEER or superintendent. Married, age 30, 8 years' construction experience, highways, bridges, sewers, docks, industrial buildings. Permanent connection sought. Salary secondary. Location immaterial. Available immediately. PW-384, Engineering News-Record, 330 West 42d Street, New York City.

GENERAL FOREMAN or foreman, sixteen years' experience medium size projects, concrete foundations, water situations, bridge plants, conduits, retaining walls. Go anywhere. PW-377, Engineering News-Record, 330 West 42d Street, New York City.

CONSTRUCTION superintendent, twenty-five years' experience on general construction, filtration plants, sewers, disposal plants, bridges, foundations, waterworks, dams. References A-1. Will go anywhere. PW-388, Engineering News-Record, 330 West 42d Street, New York City.

CONSTRUCTION superintendent or general foreman, age 44, 30 years' general field experience, railroads, highways, tunnels, foundations, etc. I have following of a complete organization: shovel, dragline, bulldozer operators, compressor and powder men. Location immaterial. PW-385, Engineering News-Record, 330 West 42d Street, New York City.

CIVIL ENGINEER: college graduate; 10 years' practical experience; private license to fly; knowledge of aerial photography and mapping. Desires position either as an engineer or in some phase of aerial mapping. PW-386, Engineering News-Record, 330 West 42d Street, New York City.

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INSPECTOR, civil engineering graduate, 5 or 6 years' experience on concrete, sewers, paving, highway work. PW-364, Engineering News-Record, 330 West 42d Street, New York City.

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SALES REPRESENTATIVES. Eastern and Southern New York State and Central Pennsylvania Territory open with structural steel fabricating plant on commission to a man of character, energy, ability and experience. Apply at once. RW-390, Engineering News-Record, 330 West 42d Street, New York City.

THREE experienced shovel and crane salesmen wanted by an old established shovel manufacturer. SW-378, Engineering News-Record, 330 West 42d Street, New York City.

OPPORTUNITIES WANTED

STRUCTURAL sales engineer and estimator. Last connection 5 years, estimating and selling structural steel, and supervising engineering department. Previous connection 4 years in charge of estimating department. Can furnish satisfactory references. SA-382, Engineering News-Record, 330 West 42d Street, New York City.

SALES engineer desires connection representing manufacturer calling on construction industry, structural fabricators, architects, contractors, and dealers. Broad experience in advancing new lines of construction materials. RA-383, Engineering News-Record, 330 West 42d Street, New York City.

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SW-380, Engineering News-Record
330 West 42d St., New York City

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WANTED
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100 H.P. Fairbanks-Morse CO Engine direct connected to approximately 75 K.W. generator, 230 Volt D.C. Good condition.
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135—Buckets. All sizes and makes.

CONVEYORS AND ELEVATORS

9—Port. belt conveyors with steel frame, gas or elec. pr. 18 and 24 in. Barber-Greene and Chic. Automatic.

CRANES, DRAGLINES AND SHOVELS

1—Northwest type M, Serial No. 2334, 60 ft. boom; 1¼-yd. bucket.

1—Industrial Brownhoist Model DC, Diesel crane. Ser. No. 5176, 60-ft. boom, 1¼-yd. bucket; also has 1⅛-yd. shovel attachment.

3—Link-Belt shovel attachments for Models K-55; K-44; K-42; K-3x; K-25 and K-2.

1—Koehring Model 501 dragline, Ser. No. 1071, 50-ft. boom, 1¼-yd. bucket.

1—Northwest Model 104, Ser. No. 2079, 45-ft. boom, 1¼-yd. dragline or clamshell bucket.

2—Osgood Nos. 2054, 2069, with 40-ft. boom, 1 with 1-yd. shovel front.

1—Brownhoist No. 2, Ser. No. 9964, 40-ft. boom, 1-yd. bucket.

1—Link-Belt K-1, Ser. No. 1024, 50-ft. boom, 1-yd. bucket.

1—Erie Type B-2 size, 1-yd. combination shovel and crane, Ser. No. 3900.

1—Industrial Brownhoist, Type CC, Ser. No. 5071, 36-ft. boom, ½-yd. bucket.

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July 2nd issue of

ENGINEERING NEWS-RECORD

close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

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Display and Undisplayed Ads: Friday, June 26th

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2—No. 30 **Caterpillar Tractors with Bull-dozers.**
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1—60 **A.S.M.E. Butt Strap Boiler.**
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1—4" **Marlow Centrifugal**, portable, 4 cyl. LeRoi gas engine.
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1—**Worthington** 3", two stage.
1—3" **Domestic**, two stage, portable, 4 cyl.

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2—7-S **Koehring and Knickerbocker**, with power loaders, steel wheels.
1—10-S **Jaeger** with power loader, water tank, rubber tires.
1—7-S **O. & S.**, low charge, steel wheels.
1—7-S **Lakewood**, low charge, steel wheels.
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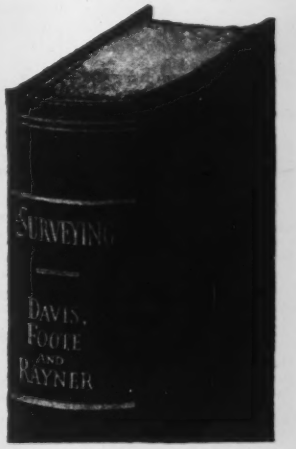

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Bids: July 8.

Paving

HENRY HUDSON PARKWAY AUTHORITY

Sealed bids, for paving the Henry Hudson Parkway from Dyckman Street to Riverdale Ave., omitting the Henry Hudson Bridge and its Approaches, will be received by the Henry Hudson Parkway Authority, Room 301, Arsenal, Central Park, New York City, until 2 p.m., Eastern Standard Time (3 p.m. Daylight Saving Time) on the afternoon of July 8, 1936, and not thereafter, and at that time the bids will be publicly opened and read.

The work will consist of the fine grading and paving, drainage, setting toll equipment and other incidental work as specified.

The time allowed for completion of the

(Continued from page 59)

OFFICIAL PROPOSALS

work under this contract is: Oct. 1, 1936.

The bond required for the faithful performance of the contract will be for the full estimated contract price of the contract awarded.

Plans, Specifications, General Provisions, and form of Bid, Bond and Contract for the work are on file at the Arsenal, Central Park, New York City, where copies may be obtained upon payment of the sum of $5.00, no part of which will be refunded. Plans are also on file at the office of Madigan-Hyland, Consulting Engineers, 521 Fifth Avenue, New York City.

All bids must be made upon blank forms attached to the Specifications, and accompanied by a certified check in accordance with the schedule given in the contract documents.

The Henry Hudson Parkway Authority

OFFICIAL PROPOSALS

reserves the right to reject any and all bids.

HENRY HUDSON PARKWAY AUTHORITY
By W. Earle Andrews,
Chief Engineer.

Dated: June 24, 1936.

Bids: July 20.

Reservoir

Lombard, Ill.

Previous bids having been rejected, bids for construction of 250,000 gallon elevated storage tank and 600,000 gallon concrete reservoir will be received by the Board of Trustees, Village of Lombard, Ill. July 20, 1936. $20 deposit required on specifications. Address inquiries Village Clerk, Lombard, Ill.

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RYERSON REINFORCING AND FABRICATING SERVICE

Save time and money by using this complete and dependable steel-service to the building industry. The steel is in stock ready to use. Experienced crews quickly form or fabricate to your specifications. Deliveries timed to your requirements.

Structural Shapes, incl. wide flange sections
U. M. and Floor Plates
Reinforcing Bars and Spirals cut, bent and tagged for placing
Wire Mesh Reinforcing
Caisson Rings
Mild Steel Bars and Shafting
Alloy Steel Bars
Stainless Steel Sheets and Bars, (Allegheny Metal)
Black and Galv. Sheets. Plain, Corrugated, Painted, etc.
Galvanized Sheets
Copper and Brass, Sheets and Bars
Boiler Tubes
Rivets, Bolts, Nuts, Nails
Welding Rod
Mechanical Tubing
Chain
Safety Treads
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JOSEPH T. RYERSON & SON, Inc.

CHICAGO MILWAUKEE ST. LOUIS CINCINNATI DETROIT CLEVELAND BUFFALO BOSTON PHILADELPHIA JERSEY CITY

YOUNGSTOWN

STEEL
YOUNGSTOWN
PIPE

In the production of Youngstown Steel Pipe the Inspection Department is entirely independent of the Manufacturing Department. Every inspector is authorized to be rigid and relentless and to insist upon the elimination of any length of pipe which in any way falls short of the quality you have a right to expect under the "YOUNGSTOWN" trademark.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - - - YOUNGSTOWN, OHIO

Tubular Products; Sheets; Plates; Tin Plate; Bars; Rods; Wire; Nails; Conduit; Unions; Tie Plates and Spikes

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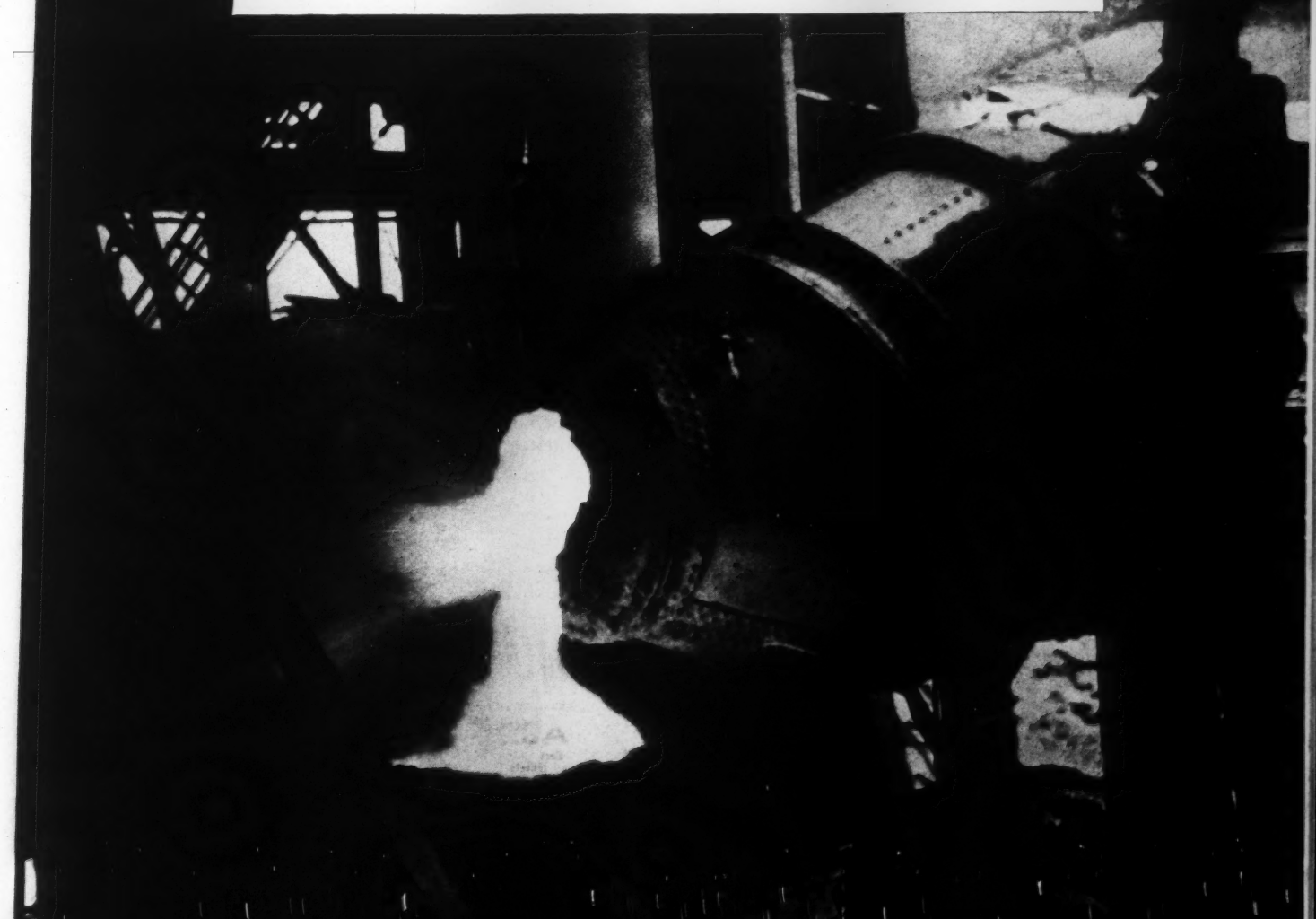

Pipe "in the raw" -- molten steel pouring from Bessemer Converter.

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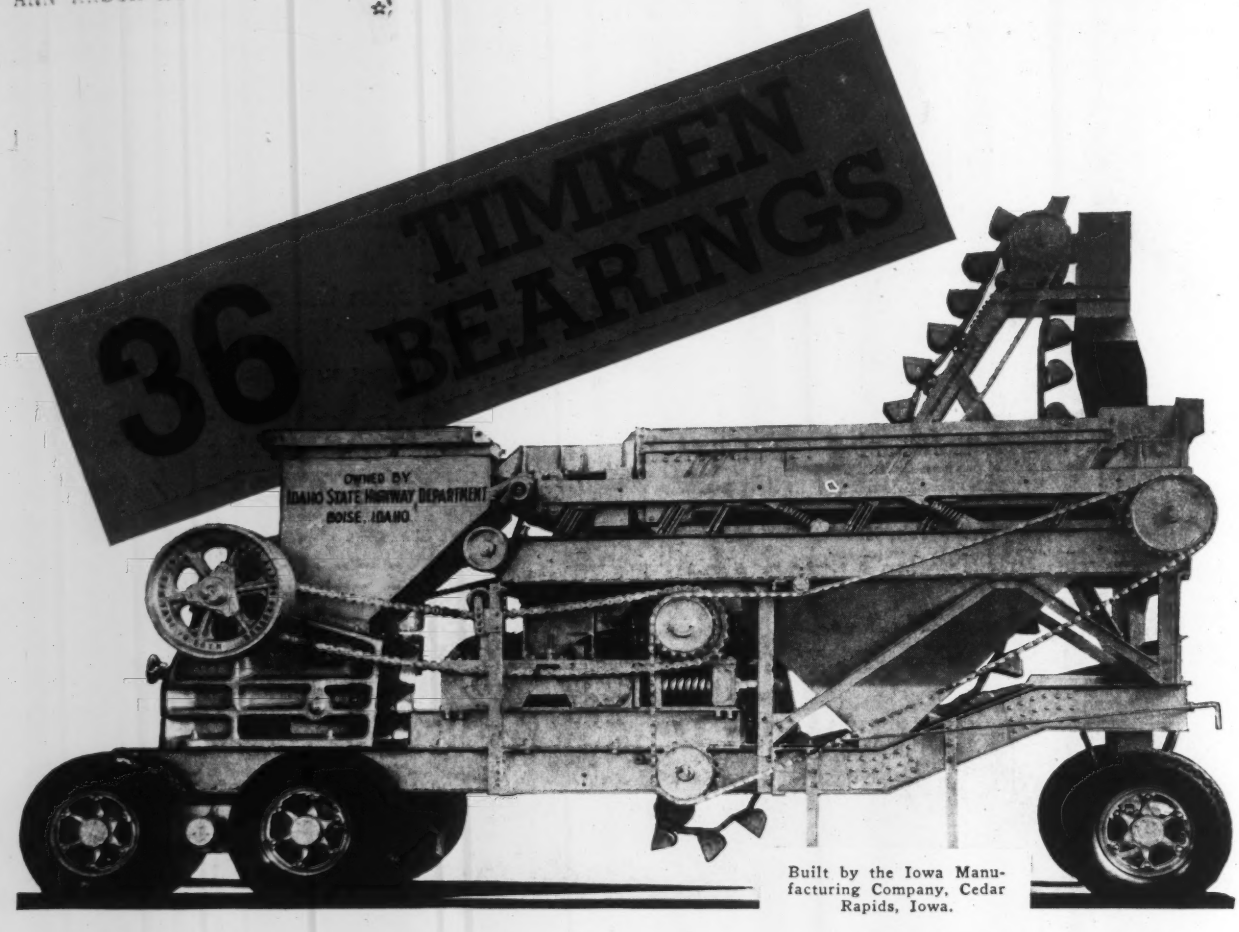

Built by the Iowa Manufacturing Company, Cedar Rapids, Iowa.

FOR ENDURANCE AND ECONOMY

This "Cedar Rapids" portable crushing and screening plant represents one of the most modern developments in equipment of this kind—modern in design and modern in its liberal use of Timken Bearings.

The crushing equipment consists of a "Cedar Rapids" 1524 Primary Jaw Crusher and 30x18 Secondary Roll Crusher with an Iowa Symons Double Deck Vibrator Screen. Timken Bearings are used throughout the crushing, screening and elevating equipment and in the road wheels, a total of 36 being employed. So completely has frictional resistance been overcome that power requirements—both in operating and hauling—have been substantially reduced.

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A symbol of quality for any piece of equipment with which it is associated

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *TAPERED ROLLER* BEARINGS